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Examining the Influence of Shared Leadership and Political Skill on the Relationship between Project Management Complexity and Project Team Effectiveness in Organizations

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EXAMINING THE INFLUENCE OF SHARED LEADERSHIP AND POLITICAL SKILL ON THE RELATIONSHIP BETWEEN PROJECT MANAGEMENT COMPLEXITY AND PROJECT TEAM EFFECTIVENESS IN ORGANIZATIONS

by

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Abstract

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Organizations are experiencing increasing complexity due to global competition, technological advances, and dynamic political and environmental circumstances. Therefore, organizations are driven to find new ways to stay competitive, including the increased use of project teams and the formulation of new types of project team leadership structures to manage complex and innovative work. The aim of this study was to examine shared leadership and political skill in project teams within the context of project management complexity, and the influence of these factors on project team effectiveness.

A quantitative cross-sectional survey design was used as the approach for data collection. A pilot study was conducted with a small sample of six project teams in one organization to evaluate and pre-test the design approach used in the main study. The main study was conducted with a sample of thirty project teams in seventeen organizations within six industries in the supply chain. Using multi-level techniques,

regression-based path analysis was performed to test the hypotheses. Results showed that project management complexity was significant in predicting team effectiveness and that shared leadership was significant in partially mediating this relationship. Results also showed that the strength of the mediated relationship was stronger under high team political skill than under low team political skill.

Findings from the study suggest practical implications for HRD professionals in leveraging shared leadership and political skill in organizations with complex management initiatives. Implications for theory and future research are discussed based upon the findings of the study.

Chapter 1 - Introduction

Background to the Problem

Organizations are experiencing change and complexity at accelerating rates due to increased competition in the global marketplace (Anderson, 2012; Birkinshaw & Heywood, 2010; Burnes, 2004, 2005; Karakas, 2009; Parsons, 2009). Faced with this rapid pace of change, organizations are increasing the use of teams, as teams are now considered to be central to organization effectiveness and survival (Tannenbaum, Mathieu, Salas, & Cohen, 2012; Wageman, Gardner, & Mortenssen, 2012a). Employees are collaborating more than ever before: virtually, across nationalities and cultures, and utilizing different languages to share ideas and form teams. There is agreement among researchers and practitioners alike that globalization, digitalization, and dynamic political and environmental climates are influencing the nature of teams and the way organizations think about and structure teams (Parsons, 2009; Rico, de la Hera, & Tabernero, 2011; Wageman et al., 2012a). In short, "old definitions are feeling the strain" (Wageman, Gardner, & Mortenssen, 2012b, p. 304).

There are many different types of teams in organizations. Types of teams are characterized by stability of the team membership, duration of existence, empowerment to determine goals and objectives, and diversity in knowledge or background (Yukl, 2006). Some examples of types of teams in organizations include functional, cross-functional, self-managed, and top executive teams (Yukl, 2006). A project team is a

specific type of team that is temporary, consists of cross-functional members, and is created to accomplish specific goals in the organization (Kerzner, 2004). Project management complexity is an attribute of projects and is measured according to the difficulty level in the management of the project (Aitken & Crawford, 2007). Project management complexity is determined by project stability, social or legal implications, financial impact, strategic importance, and number of methods involved in performing the project (Aitken & Crawford, 2007). Complexity in projects is due to dynamic or turbulent environments, or many interdependent project team goals and tasks (Clarke, 2012b). A single, hierarchical leader, the project manager, typically leads the project team, and project management models are normally used to control, track, and implement phases, steps, or patterns (Carden & Egan, 2008). Much of the current research on team leadership focuses on the leadership styles, behaviors, and roles that the single traditional leader must assume to be successful in projects that are considered complex (Carson, Tesluk, & Marrone, 2007; Clarke, 2012a, 2012b; Pearce & Sims, 2000; Small & Rentsch, 2010).

The ability of the single team leader to provide all leadership functions needed in a project that is considered complex is being questioned (Carson et al., 2007; Clarke, 2012a). Accordingly, organizations are forming new types of team leadership structures in order to perform more complex work (Kozlowski & Ilgen, 2006; Morgeson, DeRue, & Karam, 2010; Rico et al., 2011; Tannenbaum et al., 2012; Wageman et al., 2012a). Many practitioners and scholars believe that these new team structures may increase effective project team leadership within complex projects, which may have a positive impact on team success and effectiveness (Clarke, 2012a; Turner & Müller, 2005). Therefore, as

Morgeson et al. (2010) acknowledge, "what is needed is a framework that integrates existing team leadership research and describes the full range of ways in which leadership can manifest itself within a team" (p. 6).

One type of leadership found in teams is shared leadership, "an emergent team property that results from the distribution of leadership influence across multiple team members" (Carson et al., 2007, p. 1218). Recent limited research has shown that certain team-level influencing factors, such as internal team environment, shared leadership, and team cohesion have a positive influence on team performance outcomes (Carson et al., 2007; Daspit, Tillman, Boyd, & Mckee, 2013; Hoch & Kozlowski, 2012; Pearce & Sims, 2002). Carson et al. (2007) found that an environment supportive of shared leadership over time and the willingness of team members to offer as well as receive influence are necessary antecedents for the emergence of shared leadership within the team (Carson et al., 2007).

Political behavior in organizations is the active display of influence over others to obtain desired goals or results (Ferris & Treadway, 2012). According to Clarke (2012b), "a number of studies have suggested that complex projects involving many partners often experience problems in goal compatibility, commitment and a lack of collaborative behaviour that are major sources of conflict and political behaviour" (p. 201). Although political behavior is the display of influence to obtain ends to desired goals, political skill is the ability of the influencer to persuade and influence others (Ferris & Treadway, 2012). Examining the political skill of the influencer gives insight on why influence tactics may be successful (Ferris, Treadway, Kolodinsky, Hochwarter, Kacmar, Douglas, & Frink, 2005). In a study of leader political skill in casework teams in a state welfare

system, the researchers found empirical support for their hypothesis that "leader political skill will have a positive effect on team performance" (Ahearn, Ferris, Hochwarter, Douglas, & Ammeter, 2004, p. 315). The job of the team leader is to ensure team effectiveness, requiring leader ability to coach and mentor, to display interpersonal astuteness and social acuity, and to eliminate barriers to effectiveness. Political skill is beneficial in leading to these outcomes and to team effectiveness (Ahearn et al., 2004).

These findings indicate that as projects become more complex, shared leadership within the team may emerge as a response to the dynamics of the project context and thus influence project team effectiveness. Project management complexity, along with interdependency and creativity, are characteristics of teams in which shared leadership may emerge (Pearce, 2004). Projects that are complex are likely to be more successful when they exhibit higher levels of team collaboration and cohesiveness, which are characteristics of shared leadership (Clarke, 2012b). In addition, high political skill within teams may be likely to contribute to the strength of the influence of shared leadership on team effectiveness (Clarke, 2012b).

Statement of the Problem

Globalization, digitalization, and dynamic political and environmental climates are influencing the work of project teams in organizations (Parsons, 2009; Rico et al., 2011; Wageman et al., 2012a). As Clarke (2012b) suggests, "the project's goals and methods to achieve them are subject to far greater influences or forces requiring their adaptation as the environment becomes more dynamic or turbulent" (p. 199). Greater complexity in the management of projects is one factor that contributes to the emergence of shared leadership in projects. With greater project management complexity, there is a

need to understand the influence of shared leadership on project team effectiveness (Clarke, 2012a).

Empirical research generally suggests that shared leadership positively influences team effectiveness (Carson et al., 2007; Hoch, Pearce, & Welzel, 2010; Muethel, Gehrlein, & Hoegl, 2012; Pearce & Sims, 2002; Small & Rentsch, 2010). Pearce and Sims (2002) examined vertical versus shared leadership in 71 change management teams in a large manufacturing firm in the United States and found that "shared leadership appears to be a more useful predictor of team effectiveness than vertical leadership" (p. 172). Managers, internal customers, and team members rated team effectiveness using seven variables: output, quality, change, organizing and planning, interpersonal, value, and overall effectiveness. In a consulting simulation study involving 59 project teams comprised of MBA students, Carson et al. (2007) found that "shared leadership was found to predict team performance as rated by clients" (p. 1217). In the simulation study, clients were asked to rate the effectiveness of the teams based upon presentation, deliverables, and goal accomplishment. Hoch et al. (2010) found that shared leadership predicted team performance, with both age diversity and team coordination moderating the influence of shared leadership. Team performance was rated by team members via a scale developed by Hoegl and Gemuenden (2001) consisting of items considering team effectiveness (quality), and team efficiency (schedule and budget).

Although limited research shows that shared leadership may positively influence team effectiveness, research focusing on the relationship between shared leadership and project management complexity and the impact on team effectiveness is limited (Clarke, 2012b). In addition, Clarke (2012b) posits that projects with greater levels of complexity,

increased time pressures, and display of political behavior by project team members are the types of projects that may be more effective with shared leadership. Despite the increase in research and theory on organizational politics in recent decades, "there is relatively little knowledge about politics in and around teams" (Vigoda-Gadot & Vashdi, 2012, p. 287). Accordingly, the relationships of project management complexity, shared leadership, political skill in teams, and the influence of these constructs on team effectiveness need to be further explicated.

Purpose of the Study

The purpose of this study was to examine the influence of shared leadership and political skill on the relationship between project management complexity and project team effectiveness in organizations. Given that shared leadership is an emergent form of leadership in which multiple team members assume leadership responsibilities during various phases of a project, the study explored the mediating effects of shared leadership on the relationship between project management complexity and team effectiveness. The study also examined the moderating effects of team member political skill on the relationship between project management complexity and team effectiveness via shared leadership.

Theoretical Underpinning

The theoretical grounding of the study was based upon the Input-Mediator-Output-Input (IMOI) framework of team effectiveness (Ilgen, Hollenbeck, Johnson, & Jundt, 2005), the theory of shared leadership (Pearce & Sims, 2000), and the influence of political skill in organizations (Ferris et al., 2005). The construct of project management

complexity was also a dimension of this study, as complexity in projects may influence team effectiveness (Aitken & Crawford, 2007).

The Input-Process-Output (I-P-O) model of team development heavily influences recent team effectiveness research (Ilgen et al., 2005). I-P-O is a classical model of team performance incorporating a linear methodology in a progression of processes from input through output. Due to the general consensus of researchers and practitioners that teams are complex adaptive systems, rather than linear progressions of tasks to accomplish goals, the I-P-O model does not account for the more dynamic processes, as well as mediating, emerging, and influencing factors, that teams experience in reality (Ilgen et al., 2005). The IMOI model (Ilgen et al., 2005) more aptly involves dynamic factors that occur in today's functioning teams. The IMOI model consists of three temporal phases of the team life cycle: forming, functioning, and finishing. Nested within these phases are the affective, behavioral, or cognitive aspects of team development (Ilgen et al., 2005).

The IMOI framework provided the theoretical grounding necessary to identify project management complexity as an influencing factor on team effectiveness, and shared leadership as a mediating influence on the relationship between project complexity and team effectiveness. In addition, team political skill was examined as a moderating variable to determine the strength of this relationship (Carson et al., 2007). The resulting conceptual framework for this study is shown in Figure 1.

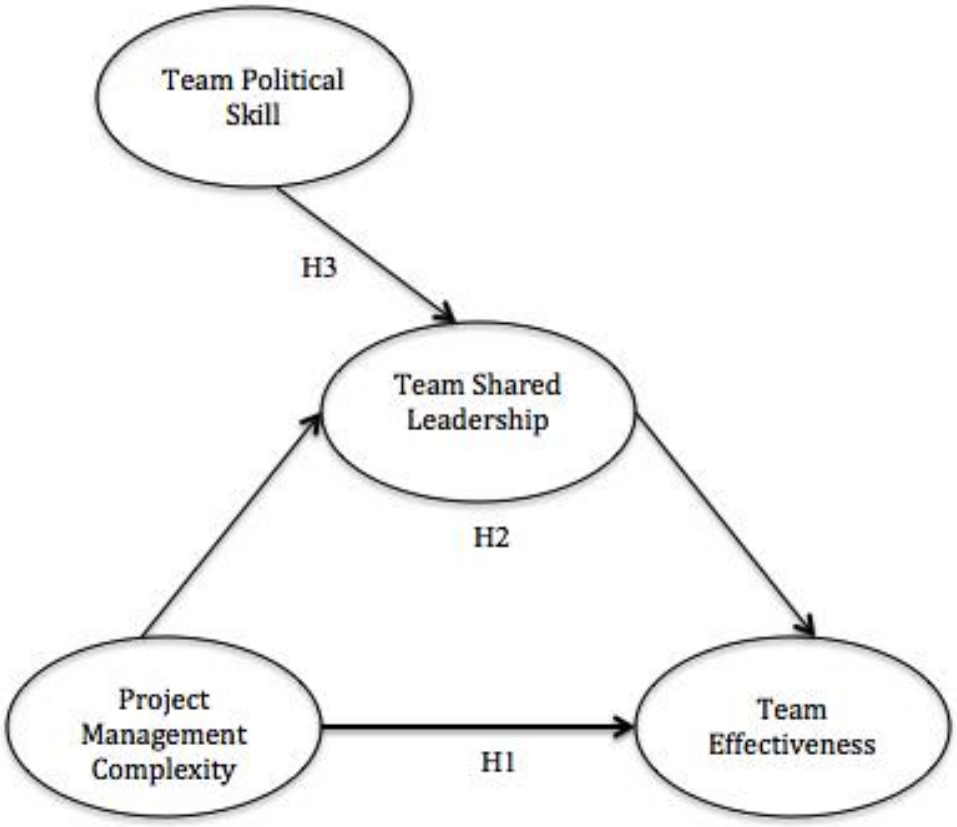


Figure 1: Moderated Mediation Conceptual Model for Project Management Complexity, Team Shared Leadership, and Team Political Skill, and the Impact on Project Team Effectiveness

Research Questions and Hypotheses

The following research questions and hypotheses guided this study:

Research Question 1: What is the impact of project management complexity on project team effectiveness?

H1: Project management complexity will positively influence project team effectiveness.

Research Question 2: Can shared leadership explain the relationship between project management complexity and project team effectiveness?

H2: Team shared leadership plays a mediating role on the relationship between project management complexity and project team effectiveness.

Research Question 3: How does team political skill influence the relationships between project management complexity, shared leadership, and team effectiveness?

H3: Team political skill will moderate the strength of the mediated relationship between project management complexity and team effectiveness via team shared leadership such that the mediated relationship will be stronger under high team political skill than under low team political skill.

Overview of the Pilot and Design of the Main Study

The following section begins with a brief description of a small-scale pilot study that was conducted in June 2013 that influenced the design of the main study. This section also presents an overview of the design of the main study.

Summary of the Pilot Study and Influence on the Main Study Design

The purpose of the pilot study was to determine the appropriateness of the recruitment approach, pre-test and examine the adequacy of the selected survey instruments, and apply the data analysis techniques to be used by the researcher in the main study. A cross-sectional survey design was used for a small convenience sample of six project teams within a large retail organization located in multiple cities. A model was designed to examine team political skill as a moderator of the mediating influence of shared leadership on the relationship between project management complexity and team effectiveness. The data was analyzed at the individual level using hierarchical multiple regression in SPSS, as the small sample size precluded analysis of the data at the team

level. Hypotheses 1 and 2 were supported, indicating that the relationship between project management complexity and team effectiveness for the small sample of six teams was partially mediated by shared leadership and political skill. Hypothesis 3 was not supported, indicating that team political skill did not moderate the relationship between project management complexity and team effectiveness via shared leadership.

The implementation of the pilot study influenced the design of the main study in several ways. The process of creating the survey instrument, recruiting the pilot study teams, and collecting and analyzing the data was invaluable in understanding the multilevel nature of the data. The scale measures incorporated in the web-based survey were tested for reliability using the pilot study data and calculating Cronbach's alphas for each measure. Scores were within acceptable ranges, imparting confidence in using the web-based survey for the current study. The pilot study confirmed the importance of a larger number of teams needed to perform analysis of results at the team level.

Design of the Main Study

The design of this study employed a quantitative strategy for the purpose of increasing the generalizability of findings and contributing to empirical knowledge in the study of teams (Bryman & Bell, 2011). A cross sectional survey design was used to collect data from individual team members and project managers on their perceptions of shared team properties (project management complexity, shared leadership, team political skill, and team effectiveness). Shared team properties "originate in experiences, attitudes, perceptions, values, cognitions, or behaviors" that are held in common by the members of a team (Klein & Kozlowski, 2000, p. 215). Due to the multilevel nature of the data (individuals and teams), the study incorporated multilevel modeling analysis

techniques. The design was appropriate for this study in that data was collected from project teams in multiple companies within multiple related industries, contributing to the ability to generalize and replicate the study. Collection of the data was through a self-report survey constructed from a set of previously validated measures of project management complexity, shared leadership, political skill, and team effectiveness.

Significance of the Study

The study is compelling, appropriate, and relevant and was designed to make several contributions to the field of HRD. The study addressed the lack of empirical research regarding the emergence of shared leadership and the presence of team political skill within the context of project management complexity. The study integrated concepts of project management complexity into the research domains of shared leadership, politics, and team effectiveness. It also augmented the understanding of the interdisciplinary nature of the study of teams in the workplace. Finally, it highlighted the importance of projects and project teams in the performing the work of organizations.

Although some empirical research suggests that shared leadership positively influences team effectiveness, research focusing on the impact of shared leadership upon team effectiveness within a complex project and project management context is needed (Clarke, 2012a, 2012b). In addition, as Vredenburgh and Shea-VanFossen (2010) suggest, "clearly organizational politics is a fundamental facet of organizational life, with implications for human resource management" (p. 27). Yet, limited research has examined the presence of political skill within teams (Vigoda-Gadot & Vashdi, 2012).

The tools and techniques of project management have been applied in the traditional fields of engineering and information technology, although limited empirical

and theoretical research on project management exists in the management, HRD, and business research domains (Carden & Egan, 2008). This study began to address this gap by integrating the concepts of shared leadership, politics, and team effectiveness into the project management literature.

This study also added to the current knowledge in research on the cross-disciplinary nature of the study of teams and groups. Researchers in many disciplines study groups, and "bridges across disciplines are rare in research on groups" (Moreland & Levine, 2009, p. 25). This study addressed this gap by drawing from the disciplines of leadership, human resource development, and social psychology, as well as project management.

Finally, organizations are continuing to face complex change and are implementing projects and project teams to perform the work of organizations (Gareis, 2010; Tannenbaum et al., 2012; Wageman et al., 2012b). Human resource development, organization development, and training practitioners in organizations are challenged to consider new relationships between team leadership and complex projects for positive impact on team outcomes (Cicmil, 1999; Karakas, 2009). This study added relevant insight to the project management literature by examining shared leadership and project team political skill and the impact on the effectiveness of teams.

Limitations of the Study

This research included limitations that were imposed due to the nature of the study. One limitation was the potential for low participant response. A second limitation was difficulty of modeling shared leadership and political skill as shared team properties and measuring these properties at the team level. A third limitation was that specific

industries were represented in the study and generalization of results may only be applied to teams in these industries.

Definition of Terms

Organizational politics. Mintzberg (1983) defined organizational politics as "individual or group behavior that is informal, ostensibly parochial, typically divisive, and above all in a technical sense, illegitimate – sanctioned neither by formal authority, accepted ideology, nor certified expertise (although it may exploit any one of these)." (p. 172).

Political skill. Ahearn et al. (2004) defines political skill as "the ability to effectively understand others at work, and to use such knowledge to influence others to act in ways that enhance one's personal and/or organizational objectives" (p. 311).

Project. According to the Project Management Institute (PMI, 2013), a project is "a temporary endeavor undertaken to create a unique product, service, or result" (p. 3). A project may also involve a single individual or multiple individuals across one or more organizations (PMI, 2013).

Project complexity. According to Aitken and Crawford (2007), "complexity is an attribute used to categorise projects" (p. 3). Factors used in determining the complexity of a project are project stability, number of methods involved in performing the project, social or legal implications, financial impact, strategic importance, stakeholder support, and complexity of interfaces with other organizational entities.

Project team effectiveness. According to Pinto and Slevin (1988), many project managers today view project success as a matter of meeting goals to achieve the stated project outcome criteria of budget, schedule, performance, and client satisfaction (p. 68).

Project management. Project management is "the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements" (PMI, 2013, p. 5).

Project team. According to PMI (2013), "the project team includes the project manager and the group of individuals who act together in performing the work of the project to achieve its objectives" (p. 35).

Shared leadership. Shared leadership is "an emergent team property that results from the distribution of leadership influence across multiple team members" (Carson et al., 2007).

Team effectiveness. Cohen and Bailey (1997) describe team effectiveness "as a function of task, group, and organization design factors, environmental factors, internal processes, external processes, and group psychosocial traits" (p. 239).

Teams in organizations. The definition of teams in organizations for this study is based upon that developed by Kozlowski and Ilgen (2006):

> A team can be defined as (a) two or more individuals who (b) socially interact (face-to-face or, increasingly, virtually); (c) possess one or more common goals; (d) are brought together to perform organizationally relevant tasks; (e) exhibit interdependencies with respect to workflow, goals, and outcomes; (f) have different roles and responsibilities; and (g) are together embedded in an encompassing organizational system, with boundaries and linkages to the broader system context and task environment (p. 3).

Summary of Chapter 1 and Organization of the Dissertation

Chapter 1 has articulated the background to the problem, the statement of the problem, the purpose of the study, theoretical underpinning, proposed research questions, design of the study, and the significance, limitations, and definitions associated with the study. Chapter 2, Review of the Literature, presents a review of the relevant and current literature in support of the study. Chapter 3, Research Design and Method, provides an overview of the design of the study. Chapter 3 provides an overview of the initial pilot study conducted to test the feasibility of the main study research approach. It describes the design, data sampling, collection, and analysis procedures of the study. It also discusses issues of reliability and validity along with the assumptions and limitations associated with the study.

Chapter 2 – Review of the Literature

Introduction

This chapter reviews the literature relevant to examining the influence of shared leadership and political skill on the relationship between project complexity and project team effectiveness in organizations. It is organized into five sections. The first section reviews the concept of teams and focuses on the increased importance of teams in modern organizations. The second section draws upon the project management discipline and reviews the constructs of projects, project teams, project management, and complexity concepts in projects. The third section addresses team effectiveness, focusing on current models and research in this area. The fourth section addresses leadership in organizations, beginning with an overview of general leadership theories and continuing with a highlight of modern models of team leadership. It concludes with a review of shared leadership in teams. The fifth section addresses the constructs of politics and political skill in teams. Chapter 2 concludes with a summary highlighting the significant elements of the literature review that support this study.

The University of Texas at Tyler Robert R. Muntz Library computer system was used to conduct searches on the following databases: Business Source Complete, Emerald, Sage, ProQuest Dissertations and Theses, PsycINFO, and ScienceDirect. Search terms included: teams, leadership in teams, leadership in project teams, shared leadership, politics in teams, project complexity, project management complexity, and project team effectiveness. Due to the paucity of empirical studies on shared leadership

and politics in project teams, specific academic and research journals related to these constructs domains were searched. These journals include the *The Project Management Journal, International Journal of Project Management, Journal of Project, Program, and Portfolio Management, Team Performance Management, Group and Organization Management, Journal of Engineering, Project, and Production Management Group Dynamics, Journal of Group Dynamics, and Small Group Research.* The search in the project management literature using the term "shared leadership" resulted in very little conceptual or empirical research specifically focusing on this phenomenon. The search identified three articles from the *Project Management Journal,* and one article in the *International Journal of Project Management*. No articles were found in the *Journal of Engineering, Project, and Production Management* or the *Journal of Project, Program, and Portfolio Management*. The search in the project management literature for politics in project teams resulted in no specific empirical research focusing on this phenomenon. Journals specifically searched were: *International Journal of Project Management*, *Project Management Journal*, and *Journal of Project, Program, and Portfolio Management*.

A Review of Teams in Organizations

> The great challenge for our time will be to absorb these changes in ways that do not overwhelm people or leave them behind. None of this will be easy (Friedman, 2006, p. 50).

Importance of Teams in Organizations

Complexity, technology, and global competition are dynamics contributing to the increase and acceleration of change in organizations (Anderson, 2012; Birkinshaw &

Heywood, 2010; Burnes, 2004, 2005; Karakas, 2009; Parsons, 2009). The type of change and complexity that modern organizations face may be inherent to the business, may be imposed from outside the organization, or may result from a change to the internal organization business model (Birkinshaw & Heywood, 2010). Outsourcing and off shoring of business processes traditionally performed internally within the company are two of the major types of change that organizations face (Anderson, 2012). Inherent and designed complexity may be intrinsic to the business, depending upon the location of business operations (Birkinshaw & Heywood, 2010). Externally imposed conditions may include changes in governmental policy and industry regulations. In addition, due to the globalization of business, a phenomenon known as the knowledge economy is contributing to the complexity of work in organizations. The knowledge economy is defined as the "production and services based on knowledge-intensive activities that contribute to an accelerated pace of technological and scientific advance as well as equally rapid obsolescence" (Powell & Snellman, 2004, p. 199). The knowledge economy is knowledge intensive, electronically connected, globalized, and without boundaries (Waddock, 2007).

Change is driving organizations to formulate new approaches to stay competitive, including the increased use of teams to manage and implement more complex and innovative work (Daspit et al., 2013; Hoch & Dulebohn, 2013; Levi, 2011; Pearce, Manz, & Sims, 2009). Teams are "increasingly the primary means for organizing work in contemporary business firms" (Robbins & Judge, 2011, p. 314). Global dynamics have "pushed organizations worldwide to restructure work around teams, to enable more rapid, flexible, and adaptive responses to the unexpected. This shift in the structure of work has

made team effectiveness a salient organizational concern" (Kozlowski & Ilgen, 2006, p. 77).

Definition of Teams in Organizations

Teams in organizations are composed of individuals who socially interact to accomplish specific team goals and tasks (Kozlowski & Ilgen, 2006). All teams in organizations display certain common characteristics, including joint participation by members in goal setting, communication among members, recognition as a defined identity, and assignment of specific member roles within the team (Anderson, 2012). Because of the shift in the structure of work in organizations, Wageman et al. (2012a) contend that we need to question current definitions of teams; the traditional definitions omit important dynamics in today's global and digital environment.

Historical Context of Teams in Organizations

As a prerequisite to the study of teams, "researchers and practitioners need to have a better appreciation for the history of research and theory regarding teams" (Leonard & Freedman, 2000, p. 16). Leonard and Freedman (2000) chronicle how teams have been influenced by historical and social events, beginning with the notion of the first teams as families, tribes, and military organizations before the mid-nineteenth century. Throughout the eras of the Industrial Revolution, World War II, the social action of the 1960's, the economic downturn of the 1980's, and the advent of the global workplace, the evolution of theories and models of teams reflect the social and political climate of change in society.

Although Leonard and Freedman (2000) outline a view of the evolution of teamwork during the last century, it is important to understand the most recent forms of

teams during the age of globalization, virtualization, and digitization. Within the last two decades, "recent research trends that treat groups as complex, adaptive dynamic systems open up new approaches to studying groups" (McGrath, Arrow, & Berdahl, 2000, p. 95). Complexity theories are a current approach to understanding work teams (Burnes, 2004, 2005; Dooley, 1997).

Typology of Teams in Modern Organizations

Wildman, Thayer, Rosen, Salas, Mathieu, and Rayne (2012) contend that "there is no shortage of literature classifying teams" (p. 97). Yukl (2006) identified many different types of teams in the workplace including top executive, functional, self-managed, and cross-functional teams. Each type of team is categorized according to certain team characteristics including autonomy in work procedures, authority, duration of existence, stability, and diversity of functional background (Yukl, 2006). For example, top executive teams are autonomous in defining work procedures, mission, and objectives, while functional operating teams have low autonomy and authority in determining work processes and objectives (Yukl, 2006).

In a systematic review of team classification literature, Wildman et al. (2012) identified 17 team classification studies in an effort to create "an integrative taxonomy of task types and a set of team-level characteristics" (Wildman et al., 2012, p. 97). The task types included managing others, advising others, human service, negotiation, psychomotor action, defined problem solving, and ill-defined problem solving. The team-level characteristics included task interdependence, role structure, leadership structure, communication structure, physical distribution, and team life span (Wildman et al., 2012).

In team classification studies, the project team is a type of team with specific defining characteristics (Cohen & Bailey, 1997; Sundstrom, McIntryre, Halfhill, & Richards, 2000). Common across the literature, the characteristics of project teams include: temporary nature, composition of members with diverse functional backgrounds, and tasks to complete specific goals (Cicmil, Cooke-Davies, Crawford, & Richardson, 2009; Eskerod & Blichfeldt, 2005; Kerzner, 2004; Wildman et al., 2012).

A Review of Projects, Project Teams, Project Management, and Complexity Concepts in Projects

Projects

The *Project Management Body of Knowledge* (PMI, 2013) defines a project as "a temporary endeavor undertaken to create a unique product, service, or result" (p. 3). In addition, "a project can involve a single individual or multiple individuals, a single organizational unit, or multiple organizational units from multiple organizations" (PMI, 2013, p. 3). A project is a method of achieving strategic organizational goals and creating innovative products. Projects are authorized as a result of many strategic change considerations, including market demands, strategic opportunities, customer requests, technological advances, and legal requirements (Kerzner, 2004; PMI, 2013).

Project Teams

According to the Project Management Institute (PMI, 2013), "the project team includes the project manager and the group of individuals who act together in performing the work of the project to achieve its objectives" (p. 35). The project team is responsible for carrying out "non-routine processes that involve the novel coordination of interrelated activities and resources to achieve beneficial change" (Sense & Fernando, 2011, p. 505).

Project Management

According to the PMI (2013), "project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements" (p. 5). The application of project management includes identifying project requirements, addressing the needs and concerns of the stakeholders during the project, and balancing the many competing constraints of the project. These competing project constraints include scope, quality, schedule, budget, resources, and risk (PMI, 2013). Project management models provide structure and organization for scheduling, performance tracking, communication, and management activities within projects (Carden & Egan, 2008).

The tools and techniques of project management have been successfully applied to complex projects in the traditional industry fields of construction, engineering, and manufacturing (Carden & Egan, 2008). However, there is limited research on the origin, history, and evolution of project management and its theoretical foundations within the business and management fields (Carden & Egan, 2008). The management education community continues to engage in a long-standing debate regarding the classification of project management as a practice or an academic discipline (Kwak & Anbari, 2009). Carden and Egan (2008) maintain that project management is an evolving field of study and as such does not have a fully established theoretical background in these areas.

Complexity Concepts in Project Management

Projects are the primary method with which complex work is introduced and executed in organizations (Haas, 2006). Due to the complexity and pace of change in organizations, scholars and practitioners are researching the potential of complexity

approaches in the application of project management theory and practice (Cicmil et al., 2009; Remington, Zolin, & Turner, 2009; Singh & Singh, 2002). Complexity is a project attribute that is used to categorize projects according to project management difficulty, and is based upon a number of different factors, including project stability, financial impact, and strategic importance of the project (Aitken & Crawford, 2007).

As the use of projects to carry out complex work increases, organizations are managing various forms and types of projects. Organizations may engage in multiple types of change requiring projects, and therefore it is important that projects can be categorized according to level of complexity (Aitken & Crawford, 2007). In their monograph on the implications of complexity theory for project management practice, Cicmil et al. (2009) define complexity theory as "the study of how order, structure, pattern, and novelty arise from extremely complicated, apparently chaotic systems and conversely, how complex behavior and structure emerges from simple underlying rules" (p. 22).

Two of the most recent theoretical concepts in complexity thinking are complex responsive process of relating (CPFR) and complex adaptive systems (CAS). CPFR is based upon communicative interaction within an organization. Research is ongoing regarding components of CPFR as a framework for project management (Cicmil et al., 2009). Scholars and practitioners in the field of project management, as well as the fields of management and social psychology, have recently placed importance upon the concepts of CAS in research and practice (McGrath et al., 2000; Saynisch, 2010; Winter, Smith, Morris, & Cicmil, 2006). A CAS is a specific type of construct with emergent, co-evolutionary, iterative, and self-organizing characteristics within the realm of

complexity theory. Co-evolution indicates that these systems must evolve with changes in their environment. Iteration means that very small changes within the system may actually result in large changes. Self-organizing indicates lack of hierarchy and control (Haas, 2006).

The PMI recognizes the importance of incorporating complexity concepts within the field of project management. Research programs on complexity in projects funded by PMI are ongoing, indicating the need and urgency for new research and theory on the nature of complex change in project settings (Saynisch, 2010; Winter et al., 2006).

A Review of Team Effectiveness

Theoretical Background and Conceptualization of Team Effectiveness

The concept of a team effectiveness model was formed during early studies of small groups (McGrath, 1964). According to McGrath (1964), a group is a set of individual members with collective properties, such as abilities, attitudes, and personality characteristics. These properties form the group's composition. Group processes are the activities that lead to task performance, group development, and effect on group composition (McGrath, 1964). This framework is the basis of the input-process-output (I-P-O) model of team effectiveness, which served as the theoretical underpinning of many early team studies (Gladstein, 1984).

In the I-P-O framework, inputs are any team member characteristics, factors, and competencies that compose the team and may derive from the individual, team, or organization level. Processes are interactions and tasks leading to completion of team goals. Outcomes are the result of team activity (Kozlowski & Ilgen, 2006; Mathieu, Maynard, Rapp, & Gilson, 2008). Although this framework has served as the basis for

many team effectiveness models (Ilgen et al., 2005; Kozlowski & Ilgen, 2006; Mathieu et al., 2008), the I-P-O model has evolved into the Input-Mediator-Output-Input (IMOI) model, a more recent version that reflects modern complexity in teamwork (Goodwin, Burke, Wildman, & Salas, 2009). This model, conceptualized by Ilgen et al. (2005), depicts the addition of mediator relationships, and a feedback loop from outcomes to inputs to represent the cyclical nature of teamwork.

Research culminating in the IMOI model "was organized around a two-dimensional system based on time and the nature of explanatory mechanisms that mediated the relationship between team inputs and outcomes. These mechanisms were affective, behavioral, cognitive, or some combination of the three" (Ilgen et al., 2005, p. 517). In their integrative review, Ilgen et al. (2005) defined three stages of team development, including a forming stage (early in development), functioning stage (developing experience within the team), and the finishing stage (completion of a cycle).

In the IMOI model, team level inputs are considered antecedents that influence team effectiveness outcomes. Inputs include interdependence, technology, team training, team leadership, and team structure. Mediating processes are transitional, actionable, and interpersonal. Another broad category of mediating processes is that of emergent states. Emergent states are dynamic and varying, depending upon the context of the team and the situation (Mathieu et al., 2008). Examples of emergent states in teams are team climate, trust, and empowerment (Mathieu et al., 2008).

Current Research on Team Effectiveness

In their review of the literature on teams, Kozlowski and Ilgen (2006) found that thousands of studies during 50 years of research are focused on understanding the

framework and processes of team effectiveness. The main purpose of the review was to summarize findings of studies that were based upon "well-developed theoretical and empirical foundations" (Kozlowski & Ilgen, 2006, p. 77). The second purpose was to make recommendations for future research, practice, and policy related to teams. As a result of the review, Kozlowski and Ilgen (2006) found evidence for the importance of team cognitive, motivational, and behavioral processes, as well as for emergent states in teams.

In a seminal review of teams and groups research from 1990 to 1996, Cohen and Bailey (1997) focused on 200 empirical studies measuring and capturing team effectiveness outcomes in organizational settings. The review resulted in a synthesis of four types of teams and three dimensions of team effectiveness addressed in the team effectiveness literature. The four types of teams included work teams, parallel teams, project teams, and management teams. The three dimensions of team effectiveness included performance effectiveness, member attitudes, and behavioral outcomes (Cohen & Bailey, 1997).

Mathieu et al. (2008) extended the Cohen and Bailey (1997) study by analyzing the next ten years of team effectiveness literature, from 1997 to 2007. This review focused on studies that highlighted the different aspects of the IMOI (Ilgen et al., 2005) team effectiveness model. Mathieu et al. (2008) concluded the review by calling for more research regarding the increasing complexity of effectiveness in teams. The findings of the study emphasized that more complex models of team effectiveness, new methodologies, and new paradigms for team effectiveness research will be needed in the future (Mathieu et al., 2008).

Examples of the most current empirical research on team effectiveness indicate varying approaches for quantifying and measuring team effectiveness, depending upon the context of the study. Mathieu, Gilson, and Ruddy (2006) analyzed team performance of 121 service technician teams from a Canadian office equipment company using archival records retained by the company. In a study of global virtual teams from one large multi-national company, the researchers created and validated a survey measurement scale of team effectiveness created specifically for the company (Maynard, Mathieu, Rapp, & Gilson, 2012). The scale was based upon interviews with management and included four items for measurement of team effectiveness: use of skills, generation of ideas, coordination, and development of the final project.

Current Research on Project Team Effectiveness

The PMI defines project management as the process of producing a result, such as a product or service, during a temporary period of time (PMI, 2013). Project teams are a classification of cross-functional teams, composed of individuals focused on completing a project objective. The use of projects is expanding as a preferred form of work in organizations (Clarke, 2012a), although there are many reported cases of projects that do not meet success criteria factors (Cao & Hoffman, 2011; Clarke, 2012a; Pinto & Slevin, 1988; Yang, Huang, & Wu, 2011).

In the project management literature, project team effectiveness is referred to as project success (Kerzner, 2004). Cost, schedule, technical outcome, and client satisfaction are the most commonly used criteria to measure project team success, although many companies use only cost and schedule as the barometer to measure successful project outcome (Kerzner, 2004). In a review of project management

literature between 1986 and 2004 for the purpose of investigating the concept of project success, Lavagnon (2009) found that there are ambiguities in the definitions of project success and project management success. According to Lavagnon (2009), "project management success refers to efficiency, an internal concern to the project team, and project success embraces concerns for efficiency and effectiveness" (p. 13).

Summary of the Review on Team Effectiveness

Although 50 years of research exists on the classification, modeling, and quantification of team effectiveness, there are differing approaches to the concept of effectiveness depending upon the research discipline or the context of the study. In addition, empirical research on the performance outcomes and effectiveness of teams is lacking in clarity:

"This has resulted in a literature where there is a great deal of consistency and construct clarity on the left-hand side of the equation (i.e., antecedents and mediating influences) and much less so when it comes to the criterion, or right-hand side. In part, this can be attributed to measurement issues. Whereas there are many established and valid measures of inputs, processes, and emergent states, criterion measures, and in particular performance indices, are often idiosyncratic and organizationally specific" (Mathieu et al., 2008, p. 415).

A Review of General Leadership, Leadership in Teams, and Shared Leadership in Organizations

> Good management controls complexity; effective leadership produces useful change (Kotter, 1990, p. 103).

This section introduces the broad concept of leadership in organizations and describes early general leadership theories that underpin more recent leadership structures in organizations. The concept of leadership in teams is articulated, along with descriptions of modern models of leadership in teams. This section also describes current concepts in leadership in project teams, a specific type of team in organizations. The section concludes with a review of the foundational concepts and current research regarding shared leadership in teams and project teams.

General Leadership in Organizations

According to Yukl (2006), leadership is "the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives" (p. 8). Although there are many definitions and interpretations of organizational leadership within a large body of research (Denis, Langley, & Rouleau, 2010), much of the research on leadership in organizations is concerned with the relationship of the individual leader to followers (Carson et al., 2007; Pearce & Conger, 2003; Pearce & Sims, 2000, 2002). Due to the complex work being performed in today's competitive environment, organizations are forming new types of leadership structures (Kozlowski & Ilgen, 2006; Morgeson et al., 2010; Rico et al., 2011; Tannenbaum et al., 2012; Wageman et al., 2012a). Several early general leadership theories contribute to the advent of new

leadership structures in organizations. These theories include the normative decision process theory, contingency theory of leadership, leader-member exchange theory, substitutes for leadership, and the functional approach to leadership (Miner, 2005).

The normative decision process theory (Vroom & Jago, 1974) states that managers and leaders decide upon their behaviors given different situations and different followers (or subordinates). According to Miner (2005), "the particular type of leadership behavior that a manager chooses to employ in a given situation depends on a variety of factors in the manager, the subordinates, and the situation itself" (p. 209). The normative decision process theory is particularly relevant for the proposed study, as it also addresses group condition and decision sharing (Miner, 2005).

The contingency theory of leadership was advanced using the contingency approach of effectiveness, and is credited to Fiedler (Miner, 2005). Related to group performance, leadership effectiveness depends upon the leader's motivation of task and the particular situation; i.e. it explains why a manager, or leader, is effective in one situation rather than another (Miner, 2005). The vertical dyad/leader-member exchange theory, developed by Graen and Schiemann (1978) focuses on the interchange, or dyad, that is created between the leader and one follower. This situation is known as a leader-member exchange, and indicates that a leader should vary his or her style depending upon the subordinate, and therefore the subordinate has a direct influence on the behavior of the leader (Pearce & Conger, 2003).

The premise of the substitutes for leadership theory is that very highly routine work tasks, or professional standards, may substitute for leadership. Kerr and Jermier (1978) state that "certain individual, task, and organizational variables act as 'substitutes

for leadership', negating the hierarchical superior's ability to exert either positive or negative influence over subordinate attitudes and effectiveness" (p. 375).

The functional approach to leadership is social problem solving. This approach defines leader functions that impact team processes, including information processing, managing personnel and material resources, and structuring (Burke, DiazGranados, & Salas, 2011).

Leadership in Teams

Many researchers consider teams the preferred organizational structure for the purpose of solving problems, making decisions, and accomplishing goals (Callanan, 2004). There are many factors leading to the increased use of teams in organizations, including changing market forces, increased competition, and changing customer demands. Because of the increased use of teams in organizations, research on teams has likewise increased (Burke et al., 2011). Much of the empirical work applies general, both individual and organization, models of leadership to teams. Burke et al. (2011) note that "researchers have called for work that explicitly examines the leadership functions, styles, and behaviors that contribute to promoting the coordinated, integrated, and adaptive processes required for effective teamwork" (p. 339). Compared to traditional leadership, team leadership is different because it must vary and be flexible depending upon the situation. Team leadership must be highly coordinated, and it also must have linkages between team members and roles (Burke et al., 2011; Carson et al., 2007; Pearce & Sims, 2002). Burke et al. (2011) define team leadership as "the enactment of the affective, cognitive, and behavioral processes needed to facilitate performance

management (i.e. adaptive, coordinated, integrated action) and team development" (p. 338).

Leadership may be the most important factor influencing team performance and is essential to the success of teams (Burke et al., 2011; Carson, et al., 2007, Hoch & Dulebohn, 2013; Hoch et al., 2010; Kozlowski & Ilgen, 2006; Morgeson et al., 2010; Muethel et al., 2012; Zacarro, Heinen, & Shuffler, 2009). In an integrative literature review, Kozlowski and Ilgen (2006) identify leadership as an important factor in influencing team climate, team mental models, team efficacy, and team learning, resulting in team effectiveness. Leadership, team interdependence, use of virtual processes, training, and team structure have been identified as team inputs that influence team outcomes (Mathieu et al., 2008). Zaccaro et al. (2009) contend that "team leadership is essential for team effectiveness" (p. 83).

Modern models of leadership in teams. Modern models of team leadership have evolved with the increased use of teams in organizations. These leadership models include hierarchical and vertical, formal as opposed to informal, and internal as opposed to external. The models also include leadership of co-located teams, virtual teams, self-managed teams, and multi-team systems (MTSs).

***Hierarchical and vertical team leadership*.** Hierarchical team leadership is a formal team structure in which there is a very clear chain of command with a formally appointed leader (Morgeson et al., 2010). According to Hoch and Kozlowski (2012), "hierarchical leadership is represented by transformational leadership, leader-member exchange, and supervisory mentoring" (p. 2). In addition, Pearce and Sims (2002)

acknowledge that "vertical leadership stems from an appointed or formal leader of a team" (p. 172).

Formal and informal leadership. Formal and informal leadership refers to the level of formalization of team performance or team outcomes. If responsibility for the team outcome is formalized within the organization, the leadership of the team is considered formal; if there is no responsibility for the team outcome, leadership is considered informal (Morgeson et al., 2010).

Internal and external (to the team) leadership. Whether leadership is external or internal to the team refers to whether the leader of the team is a member of the team. If the leader is a member of the team and part of the team's process life cycle, team leadership is considered internal; if not a member of the team and outside of the process life cycle, then leadership is considered external (Morgeson et al., 2010).

Leadership of co-located teams. The approach to leadership of co-located teams is normally functional and demonstrates the identification and solution to problems by the leaders (Burke et al., 2011). Co-located teams are those whose members are physically and environmentally linked. Much of the empirical research involving teams is on co-located teams (Burke et al., 2011).

Virtual team leadership. Virtual teams are those "whose members use technology to varying degrees in working across locational, temporal, and relational boundaries to accomplish an interdependent task" (Martins, Gilson, & Maynard, 2004, p. 808). Leadership of virtual teams is differentiated from traditional, or co-located, teams by two main characteristics: physical distance between team members and use of technology to communicate with team members (Bell & Kozlowski, 2002).

Leadership of self-managed teams. Supervisors continue to be involved and play a role in self-managed work teams, although the self-managed team directs its own work tasks. Therefore, external control of the self-managed work team is strong (Carson, Mosley, & Boyar, 2004). Manz and Sims (1987) identified six leadership behaviors associated with leading self-managed teams: encouraging self-evaluation, goal setting, reinforcement, criticism, expectation, and rehearsal.

Leadership of multi-team systems. Leadership of multi-team systems spans multiple teams and projects. Multi-team systems consist of two or more teams that interact directly to accomplish common goals (Burke et al., 2011).

Leadership in Project Teams

Project teams are formed in organizations for the purpose of accomplishing goals within specific timeframes (Kerzner, 2004). Leadership in project teams is described in *A Guide to the Project Management Body of Knowledge* (PMBOK) as the traditional form of leadership, with the project manager acting as the single, hierarchical leader (PMI, 2013). In order to achieve project success, the project manager must have a strong leadership style throughout all phases of the project (PMI, 2013). According to the PMBOK, leadership of the project manager:

> Involves focusing the efforts of a group of people toward a common goal and enabling them to work as a team. In general terms, leadership is the ability to get things done through others. Respect and trust, rather than fear and submission, are the key elements of effective leadership. (PMI, 2013, p. 513).

The PMBOK does not endorse a particular theory for the leadership of projects, but rather recommends adjusting leadership style and skills according to the situation at

hand (PMI, 2013). According to the PMBOK, "there are multiple leadership theories defining leadership styles that should be used as needed for each situation or team" (PMI, 2013, p. 284). Much of the research and conceptual literature on leadership in projects addresses style or behavioral aspects of the project manager (Clarke, 2012a). Kerzner (2004) emphasizes the importance of situational leadership and behavioral excellence in order to achieve project success.

Recent studies in project management analyze the impact of leadership style and behavior on project performance (Ammeter & Dukerich, 2002; Anantatmula, 2010; Yang et al., 2011; Turner & Müller, 2005). The results of these studies are inconsistent. Yang et al. (2011) investigated the relationship between project manager leadership style and project success in a study involving construction projects in Taiwan. This study showed that the leadership style of the project manager enhances the relationships among team members, improving teamwork leading to increased project performance. Ammeter and Dukerich (2002) interviewed project team members in 151 construction and engineering projects in a study focusing on project team leader behaviors, finding that "leader behavior had a powerful and pervasive role in determining the feelings of success and actual success of project teams" (p. 9).

Turner and Müller (2005) were commissioned by the Project Management Institute (PMI) to conduct research to determine whether the competence of the project manager, including leadership style of the project manager, is a success factor for projects. In contrast to the Yang et al. (2011) and Ammeter and Dukerich (2002) studies, their integrative review of the management and project management literature showed inconsistencies in whether project management leadership style is a critical success

factor. According to Turner and Müller (2005), the project management literature "has, by and large, ignored the project manager (and his or her competence, personality, or leadership style) as a project success factor" (p. 57). In direct contrast, Turner and Müller (2005) found general management literature to support that "leadership style and competence of the manager has a direct and measureable impact on the performance of the organization or business" (p. 59). In a later study, Müller and Turner (2007) investigated leadership profiles across several project management professional organizations and found that "there are differences in project manager leadership competency profiles in some different types of successful projects." (p. 443).

In summary, the literature shows inconsistencies around the theoretical research regarding leadership in projects. As Clarke (2012a) acknowledges, "leadership specifically within project teams has not received the attention it deserves" (p. 128), and "an overall theory of leadership in projects has yet to emerge" (p. 128).

Shared Leadership

Foundational concepts of shared leadership. Several theoretical advances have led to the definition and concept of shared leadership as a team phenomenon (Pearce & Conger, 2003). Shared leadership refers to "a group process in which leadership is shared among, and stems from, team members" (Pearce & Sims, 2002, p. 172). Shared leadership is a collaborative and emergent dynamic group interaction process in which team members who have the particular expertise for the problem at hand lead the team in the solution (Pearce & Conger, 2003; Pearce et al., 2009). Shared leadership is also considered a team property in which leadership is shared, or distributed, across multiple team members, rather than being the responsibility of a single, hierarchical (or vertical)

team leader (Carson et al., 2007). It occurs when leadership is shared by, and emerges from, members of the team (Carson et al., 2007). Hoch and Dulebohn (2013) state that "shared leadership is characterized by collaborative decision-making, knowledge sharing, shared responsibility for outcomes, and team members leading each other toward the achievement of goals" (p. 115). In addition to the contribution of early organizational leadership theories and modern models of team leadership, other foundational concepts of shared leadership include self-leadership, self-managing work teams, and self-governing work teams.

Self-leadership, also known as self-management, is defined as behavior that is controlled by internal, rather than external, forces (Stewart, Courtright, & Manz, 2011). In their integrative literature review on self-leadership, Manz and Sims (1987) describe the extension of self-leadership to the team level, in which team members are allowed to manage their own behavior and determine their own work tasks.

Typically, leaders of organizations select team members, set goals, and have overall responsibility for outcomes, guiding the individual team members toward responsibility for the performance of the team (Zacarro et al., 2009). Arising during the 1980's as a result of the economic necessity of cutbacks in middle management, the notion of self-managed teams is rooted in the decision of many organizations to allow a measure of decision-making authority to workers in teams (Anderson, 2012).

Whereas self-managed teams are given authority by upper management, self-governing teams are the product of a changing workforce that prefers autonomy and non-traditional work experiences. According to Wageman et al. (2012b), "rather than simply seeing more self-managed teams, we are seeing an explosion in self-governing teams that

form themselves, determine their own purposes, composition, processes, and systems, and frequently work with other teams across organizational, geographic, and sectoral boundaries" (p. 49).

Shared leadership in teams. Current scholarly literature in the study of teams classifies the concept of shared leadership as "state of the art in team leadership" (Burke et al., 2011). Although it is a topic of interest in current research, the root of this phenomenon began in the early 1920's with the study of "the law of the situation" (Pearce & Conger, 2003, p. 7). This concept was introduced by Mary Parker Follett in 1924, and involves the notion that "one should follow the lead of the person with the most knowledge regarding the situation at hand" (Pearce & Conger, 2003, p. 7) rather than follow the formal leader. Leadership, up to this point, had been based upon the linear, mechanistic culture in organizations during the Industrial Revolution, although the first seeds of the concept of team building had entered into the work of prominent researchers (Leonard & Freedman, 2005). Integrative literature reviews on the study of leadership in teams show that the majority of the scholarly literature from this time period focuses on the more formal, vertical leadership of the individual (Carson et al., 2007, Clarke, 2012a, 2012b; Daspit et al., 2013; Hoch & Dulebohn, 2013).

Mathieu et al. (2008) reviewed three particular aspects of team leadership that impact team outcomes: external leadership, coaching, and shared leadership. External leadership is the presence of a formal leader who is responsible for the team outcome and typically refers to a hierarchical, or vertical, form of leadership (Carson et al., 2007; Morgeson et al. 2010; Pearce & Sims, 2002). Team coaching is the influence of outside interaction with the team to assist with problems, solutions, and consultation. Shared

leadership is an emergent property of the team in which leadership is distributed across team members as necessary for the task at hand (Mathieu et al., 2008).

Shared leadership in project teams. Empirical research on shared leadership in project teams in the last two decades is limited and has shown conflicting results. In Prabhakar's (2005) mixed-method study of leadership practices in 28 countries involving 153 project managers, the researcher found that the ability of the project manager to switch to another leadership style produces more success in projects than encouragement of shared leadership within the team by the project manager. The researcher also found that an autocratic style of leadership results in more successful projects (Prabhakar, 2005). In a more recent study, Thomas and Mengel (2008) identified project management concepts needed by project managers in dynamic and complex environments in organizations today: "shared leadership, social competence and emotional intelligence, communication, skills in organizational politics, and the importance of visions, values, and beliefs have emerged as competencies that are required from project managers in complex environments" (p. 308).

Other empirical studies regarding shared leadership in project teams in various contexts examine the positive influence of shared leadership on team effectiveness. In a study involving undergraduate student cross-functional teams (CFTs), shared leadership as an influencing factor on team effectiveness was examined. Results of this study showed that "the relationship between internal team environment and team effectiveness is fully mediated by shared leadership" (Daspit et al., 2013, p. 48).

In a study of 101 research and development virtual teams in the manufacturing industry, Hoch and Kozlowski (2012) found that regardless of whether the team is

considered a virtual team, there is a significant relationship between shared team leadership and team performance. In a study with data from 96 virtual software implementation project teams from 36 companies, Muethel et al. (2012) also analyzed the impact of shared leadership in virtual teams and the implications for human resource management and found support for increased team performance.

Hoch et al. (2010) examined the impact of shared leadership, age diversity, and coordination on team performance with data collected from 96 team members in 26 project teams from a German consulting company. The results of the study showed that shared leadership, moderated by age and team coordination, predicted team performance. In another study involving business students, Small and Rentsch (2010) found that "shared leadership was positively related to team performance" (p. 203).

Realizing the importance of addressing the advantages and disadvantages of shared leadership versus vertical leadership in project teams, Clarke (2012b) developed a set of research hypotheses for two purposes: to investigate the conditions that may encourage the emergence of shared leadership in projects, and the factors associated with the contribution of shared leadership to the successful outcomes of projects. Clarke (2012b) hypothesized that shared leadership would be more effective than vertical leadership in complex projects, in projects where goals are ambiguous, where time pressures are present, and during the execution phases of projects. Clarke (2012b) also hypothesized that shared leadership would be more effective than vertical leadership in projects that have high levels of political behavior. Although there is limited research in the area of shared leadership and its impact on team performance, additional research is

needed to understand the conditions under which shared leadership might emerge (Clarke, 2012b).

A Review of Politics and Political Skill in Teams

Politics in organizations are simply a fact of life (Ferris & Kacmar, 1992, p. 93).

Theoretical Background of Politics in Organizations

The constructs of power, politics, political skill and associated political behaviors have been studied over hundreds of years, beginning with the writings of Plato, Aristotle, and Machiavelli (De Vries, 2007; Vigoda-Gadot & Vashdi, 2012). Ferris and Treadway (2012) state that "power, politics, and influence in organizations have remained inextricably intertwined constructs for decades" (p. 3).

Kacmar and Carlson (1997) determined several common themes in the literature when searching for a complete definition of organizational politics: 1.) individuals engage in political activities for the purpose of influencing others; 2.) political behaviors promote one's own self-interest; and, 3.) two or more individuals must be involved in the activity or behavior, and the individuals involved may possess differing interests. In summary, "one general definition allows one to view organizational politics as social influence attempts directed at those who can provide rewards that will help promote or protect the self-interests of the actor" (Kacmar & Carlson, 1997, p. 629).

Political behavior and political skill are key concepts within the broader definition of organizational politics. Early concepts of political behavior in organizations were depicted in a model of perceptions of politics developed by Ferris and Kacmar (1992). The model was extended in later research by adding specific predictors of perceptions of politics, including organizational, job, and personal influences (Kacmar, Bozeman,

Carlson, & Anthony, 1999). With this conceptual model as a framework, the Perceptions of Organizational Politics Scale (POPS) was created and later extended, for the purpose of increasing empirical research in the area of political behavior in organizations (Kacmar & Carlson, 1997; Kacmar & Ferris, 1991).

Recent empirical work has conceptualized and further defined the construct of political skill in organizations (Ferris et al., 2005). Ahearn et al. (2004) define political skill in organizations as the ability to use knowledge to influence others in order to enhance personal or organizational objectives. The Political Skill Inventory (PSI) is a scale developed to measure political skill of individuals in organizations (Ferris et al., 2005).

As with the study of leadership, the focus of the study of politics in organizations is at the individual level, with little attention to political behavior in teams (Vigoda-Gadot & Vashdi, 2012). This section of the literature review focuses on the constructs of politics and political skill in teams, and particularly within the context of project teams in organizations.

Politics and Political Skill in Teams

Teams are influenced by other teams and from the organization as a whole. With the changing nature of teams in the workplace, politics in teams is regarded as a part of teamwork today:

> Without the traditional solid structures of yesteryear, teams now have to take responsibility for the entire picture of what, how and why they do what they do. Where hierarchies and work patterns might have provided a relatively constant context in the past, this is no longer reliably the case. Navigating politics, dealing

> with ambiguity, diminishing resources, handling emotions and 'managing upwards' are all key elements of teamwork today. (Stewart & Wainwright, 2012, p. 35).

Research involving politics at the team level is limited, with most research focusing on the concepts of positive and negative politics and the impact of these concepts on employee reactions (Vigoda-Gadot & Vashdi, 2012). Fedor, Maslyn, Farmer, and Bettenhausen (2008) conducted a study of 119 MBA students from one university to analyze whether perceptions of positive and negative politics are distinct at the individual, group, and organization level, and also if positive politics contribute to identified employee reactions. Results of the study showed support for distinct positive and negative perceptions at all three levels. Results also showed that positive politics contributed significantly to job satisfaction, coworkers, and supervision (Fedor et al., 2008).

Other limited research addresses the influence of leader political skill on employee perceptions and team performance with conflicting results. Ahearn et al. (2004), in an empirical study of ongoing casework teams in a large state welfare system, developed one hypothesis related to leader political skill and its impact on team performance. Using the political skill inventory scale to measure individual team leader skill, the results of the study indicated that variance in team performance was attributable to the political skill of the leader, more so than team empowerment (Ahearn et al., 2004).

Politics and Political Skill in Project Teams

Pinto (2000) linked the role of power and political behavior to successful project outcomes, focusing on the political behavior of the individual project manager rather than

political behavior as a shared team property. According to Pinto (2000), "the field of project management is one that is particularly fraught with political processes for several unique reasons" (p. 85). Project teams are normally cross functional in nature, and therefore the project manager has no formal authority over the team members. Also, because projects do not typically exist within the functional realm of the organization, acquisition of team members is typically the result of influence and bargaining by the project manager (Pinto, 2000).

In summary, there is a lack of empirical research that examines the relationship of political skill as a shared team property and the influence on team effectiveness within a project context. Vigoda-Gadot and Vashdi (2012) suggest that "future research must begin to examine the antecedents and consequences of team politics" (p. 314). The phenomenon of politics in teams needs to be further explicated, as teams are increasingly the focal work unit in organizations.

Summary of Chapter 2

This chapter has reviewed the literature on teams, team effectiveness, shared leadership and team political skill in organizations. The literature review has suggested that, due to the increase in global competition and environmental dynamics, organizations are changing at a rapid pace (Anderson, 2012; Birkinshaw & Heywood, 2010; Burnes, 2004, 2005; Karakas, 2009; Parsons, 2009). As organizations strive to remain competitive in the current complex global environment, the work of teams is becoming increasingly important and more complex models of teams, team leadership, and team effectiveness are evolving (Hoch & Dulebohn, 2013; Kozlowski & Ilgen, 2006; Pearce et al., 2009).

Teams, and specifically project teams, are becoming the primary means to organize complex work in organizations (Haas, 2006). Although there are many different types of teams and a large body of empirical research classifying teams and their use in organizations, research on the use of teams in organizations within the context of project management complexity is limited (PMI, 2013; Saynisch, 2010; Winter et al., 2006).

In addition, due to the increase in the use of teams in organizations to perform complex work, the effectiveness of teams is becoming more important. As Kozlowski and Ilgen (2006) note, "this shift in the structure of work has made team effectiveness a salient organizational concern" (p. 77). Although the literature indicates a large volume of research on team effectiveness particularly within the last fifty years (Kozlowski & Ilgen, 2006), more complex models for team effectiveness research are needed (Mathieu et al., 2008). Additionally, more empirical research regarding complexity and its impact on the effectiveness of teams is needed (Mathieu et al., 2008).

Researchers agree that leadership is an important component contributing to effective teamwork (Burke et al., 2011). One dynamic form of team leadership is shared leadership, a collaborative and emergent group interaction process in which leadership is shared among team members (Pearce & Sims, 2002; Pearce & Conger, 2003). Although limited studies have shown that a positive relationship may exist between shared leadership and team performance (Hoch et al., 2010; Hoch & Kozlowski, 2012; Small & Rentsch, 2010), empirical research on the influence of shared leadership on team effectiveness within the context of project management complexity is needed (Clarke, 2012b). In addition, more research is needed to identify conditions in projects under which shared leadership might emerge (Clarke, 2012b).

Power, politics, and political skill have been studied extensively at the organization and individual level, although limited research exists at the team level (Vigoda-Gadot & Vashdi, 2012), and specifically within a project team context (Clarke, 2012b). The literature links the role of power and political behavior to successful project outcomes, although research in this area is limited to the individual leader level rather than as a shared team property (Ahearn et al., 2004; Pinto, 2000). Therefore, more research is needed regarding the influence of team political skill on team effectiveness.

In summary, while the literature reflects a substantial amount of research on teams and team effectiveness in organizations, there is limited research within the context of complex projects. There is also limited research on the emergence of shared leadership within complex projects and the influence on team effectiveness. In addition, there is also a lack of empirical research examining political skill as a shared team property and the influence on team effectiveness. Therefore, these relationships were examined in this study.

Chapter 3 – Research Design and Method

Introduction

This chapter presents the research questions and hypotheses for the main study, followed by an overview of an initial pilot study designed and implemented for the purpose of testing the feasibility of the main study research approach. This chapter describes the design and rationale for the design choice, and outlines the approach to data sampling, collection, and analysis procedures. Issues of reliability and validity, as well as assumptions and limitations of the study, are also addressed.

Research Questions and Hypotheses for the Study

Three research questions guided this study: 1.) What is the impact of project management complexity on project team effectiveness? 2.) Can shared leadership explain the relationship between project management complexity and project team effectiveness? 3.) How does team political skill influence the relationship between project management complexity and team effectiveness via shared leadership?

Project complexity is an attribute used to categorize projects into different project types in organizations (Aitken & Crawford, 2007). For purposes of this study, project complexity refers to how difficult the project is to manage, that is, project management complexity. Relevant to the attribute of complexity in projects is the potential correlation with project team effectiveness. Empirical research has shown that project managers of projects with high complexity rate their own effectiveness higher than managers of projects with low complexity (Müller & Turner, 2007). In a study of team members from

multiple capital facility projects in Taiwan, Yang et al. (2011) demonstrated that team effectiveness is influenced by project complexity. Müller and Turner (2007) suggested that although the topic of project complexity is important, "it is not yet well researched" (p. 308). Although the suggestion that project management complexity will positively impact team effectiveness may be counterintuitive, other theoretical concepts, such as goal theory, may support this relationship. According to Locke and Latham (1990), a high performance cycle "begins with organizational members being faced with high challenge or difficult goals" (p. 240). High performance results when organizational members are committed to the goals and have high expectations of success (Locke & Latham (1990). The following hypothesis was proposed for the first research question:

Hypothesis 1: Project management complexity will positively influence project team effectiveness.

According to Yang et al. (2011), projects that display characteristics of high complexity are more likely to be successful when high levels of team communication, collaboration, and cohesiveness are present. These characteristics are associated with shared leadership in teams (Clarke, 2012b).

Recent limited research has shown that shared leadership has a positive influence on team performance outcomes. In a sample of 59 consulting teams, "shared leadership was found to predict team performance as rated by clients (Carson et al., 2007, p. 1217). In a study involving 26 teams in a consulting company in Germany, Hoch et al. (2010), found "a positive main effect of shared leadership on team performance" (p. 110). Daspit et al. (2013) performed a study to examine contributing factors to the success of cross-functional teams. In this study, Daspit et al. (2013) examined the influence of shared

leadership on cross-functional teams, and found a "positive and significant" (p. 45) relationship between shared leadership and team effectiveness (p. 45).

Although little research has specifically examined shared leadership as a mediator of the relationship between project management complexity and team effectiveness, the IMOI model of team effectiveness provides the theoretical support suggesting that this relationship exists (Ilgen et al., 2005). In developing the IMOI model, Ilgen et al. (2005) described team processes that involve member actions or affective states that influence team outcomes and referred to these "mediators as *emergent* states" (Mathieu et al., 2008, p. 414). In the IMOI model, team level inputs include organizational context, team context, and team members, and are considered antecedents that influence team effectiveness outcomes. Clarke (2012b) suggests that project complexity is an external factor that enables shared leadership in projects.

Although shared leadership as a mediator was not specifically examined, in a study of 59 consulting teams Carson et al. (2007) posited that a positive relationship exists between internal team environment and shared leadership in a team, as well as between shared leadership and team performance. In addition, Daspit et al. (2013) found that shared leadership fully mediates the relationship between internal team environment and team effectiveness. This evidence suggests that shared leadership may have a mediating influence on the relationship between project management complexity and project team effectiveness. The following hypothesis was proposed for the second research question:

Hypothesis 2: Shared leadership in project teams plays a mediating role on the relationship between project management complexity and project team effectiveness.

Political skill is recognized as one of the most important leader competencies contributing to organizational effectiveness (Ahearn et al., 2004; Ferris et al., 2005; Harris, Kacmar, Zivnuska, & Shaw, 2007; Treadway, Hochwarter, Ferris, Kacmar, Douglas, Ammeter, & Buckley, 2004). According to Harris et al. (2007), there is limited research on the construct of political skill in organizations, "most of which measures direct relationships with political skill and outcomes" (p. 279). Much of the empirical evidence shows that political skill may predict job performance and effectiveness in individuals (Blickle, Meurs, Zettler, Solga, Noethen, Kramer, & Ferris, 2008; Liu, Ferris, Zinko, Perrewé, Weitz, & Xu, 2007).

Ferris et al. (2005) defined four dimensions for the political skill construct: social astuteness, interpersonal influence, networking ability, and apparent sincerity. In a study designed to examine the measurement of the political skill construct dimensions and to validate the Political Skill Inventory (PSI), Ferris et al. (2005) demonstrated that political skill significantly predicted job performance and effectiveness ratings in two samples made up of distinct occupational groups. According to Ferris et al. (2005), the PSI was a significant predictor of subordinate evaluation of leader effectiveness. Liu et al. (2007) found political skill significantly related to job performance, controlling for extraversion, in a study involving 145 industrial salespersons. In a study involving students at a university in the United States, Treadway et al. (2004) found that political skill of leaders positively predicted trust, support, job satisfaction, and other employee reactions.

Ferris, Treadway, Perrewé, Rouer, Douglas, and Lux (2007) further posited that the construct of political skill has "both direct effects on outcomes and moderating effects on predictor-outcome relationships" (p. 291). In a study examining the effects of political skill on influence tactics, Kolodinsky, Treadway, and Ferris (2007) suggest that political skill may moderate organizational relationships, such as between perceptions of politics and work outcomes. Treadway, Hochwarter, Kacmar, and Ferris (2005) found political skill to be a moderating effect in the relationship between political behavior and emotional labor. Harris et al. (2007) examined political skill as a moderator in the relationships between five different impression management behaviors, showing support for the hypothesis "that the relationships will be positive when political skill is high and negative when political skill is low" (p. 280).

Although limited empirical evidence shows that political skill is related to individual job performance (Ferris et al., 2005), research involving the study of politics at the team level is limited (Vigoda-Gadot & Vashdi, 2012). In a study testing the role of leader political skill in the performance of casework teams in a state child welfare system, Ahearn et al. (2004) found that team performance is positively influenced by leader political skill. According to Ahearn et al. (2004), "the type of participation that leaders foster in their team has a substantial impact on team performance" (p. 314). In addition, teams in which leaders share control with subordinates outperform teams in which the leader exerts greater control over subordinates (Ahearn et al., 2004). Clarke (2012b) posits that shared leadership will be more effective than vertical leadership in projects that display complexity characteristics and have a "greater propensity for political behaviors" (p. 204) within the team. In addition, in a study of eight

microcomputer firms, Eisenhardt and Bourgeois (1988) found empirical evidence suggesting that organizations with a single dominant leader show lower performance than those organizations whose senior leaders share power, suggesting that the relationship between project management complexity and team effectiveness will be weaker at lower levels of political skill.

Regarding the influence of political skill in the mediated relationship between project complexity and team effectiveness via shared leadership, the following hypothesis was proposed for the third research question:

Hypothesis 3: Team political skill will moderate the strength of the mediated relationship between project management complexity and team effectiveness via shared leadership such that the mediated relationship will be stronger under high team political skill than under low team political skill.

Overview and Influence of the Pilot Study on the Main Study

Introduction

A pilot study is often conducted as a precursor to a main study implementation (Arain, Campbell, Cooper, & Lancaster, 2010; Bryman & Bell, 2011; Leon, Davis, & Kraemer, 2011). According to Leon et al. (2011), "the purpose of conducting a pilot study is to examine the feasibility of an approach that is intended to be used in a larger scale study" (p. 626). It can also guide the design and implementation of the larger scale study (Leon et al., 2011). According to Bryman and Bell (2011), a pilot study should be conducted, if possible, "before administering a self-completion questionnaire" (p. 262), for purposes of ensuring that the research instrument performs well. The pilot study "is a

version of the main study that is run in miniature to test whether the components of the main study can all work together. It is focused on the processes of the main study" (Arain et al., 2010, p. 5).

A small-scale pilot study designed by the researcher, under the direction of Drs. Ellinger and Astakhova and approved by the Institutional Review Board of The University of Texas at Tyler, commenced in June 2013. The purpose of the pilot study was to implement and determine the appropriateness of the recruitment approach, to pre-test and examine the adequacy of the selected survey instruments, and to apply the data analysis techniques to be used by the researcher in the proposed main study. A model was designed to examine team political skill as a moderator of the mediating influence of shared leadership on the relationship between project management complexity and team effectiveness. A cross-sectional, web-based survey design was used for a small convenience sample of six information technology and change management project teams within a retail organization with locations in multiple cities in the United States. The data was analyzed using hierarchical multiple regression using SPSS. In addition, LISREL was used to perform pre-test confirmatory factor analysis on the study variables to assess the model fit of the scale constructs to the data. The following is a brief report of the pilot study, concluding with a summary of useful knowledge gained that was applied to the main study.

Report of the Pilot Study

Pilot study research questions and hypotheses. In the effort to potentially inform the main study, the pilot study duplicated the main study research questions and hypotheses. Three research questions were designed to investigate the impact of shared

leadership on the relationship between project management complexity and team effectiveness, as well as how team political skill influences the relationship between project management complexity and team effectiveness via shared leadership.

Research Question 1: What is the impact of project management complexity on project team effectiveness?

Hypothesis 1: Project management complexity will positively influence project team effectiveness.

Research Question 2: Can shared leadership explain the relationship between project management complexity and project team effectiveness?

Hypothesis 2: Shared leadership mediates the relationship between project management complexity and project team effectiveness.

Research Question 3: How does team political skill influence the relationship between project management complexity and team effectiveness via shared leadership?

Hypothesis 3: Team political skill will moderate the strength of the mediated relationship between project management complexity and team effectiveness via shared leadership such that the mediated relationship will be stronger under high team political skill than under low team political skill.

The resulting conceptual framework for the pilot study is shown in Figure 1 (as shown in Chapter 1).

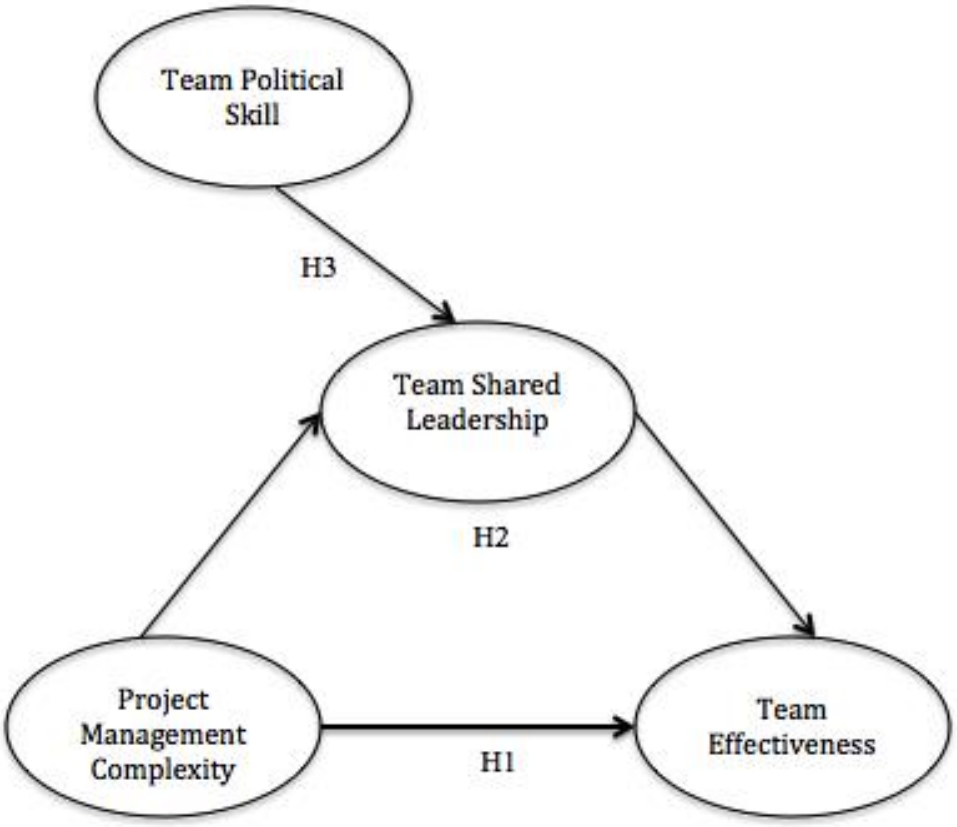


Figure 1: Moderated Mediation Conceptual Model for Project Management Complexity, Team Shared Leadership, and Team Political Skill, and the Impact on Project Team Effectiveness

Sample, setting, and procedures for the pilot study. The sample consisted of six temporary project teams located in the corporate offices and 151 retail stores in a retail company in the United States. The retail stores were located in multiple cities within the U.S. The six temporary project teams were cross-functional in nature, and were composed of team members from various business operational units within the company. Project team members reported directly to functional and operational managers, although they reported to a project team manager for the duration of the project. Each team consisted of multiple project team members and one project team manager.

Ninety-one (91) study participants from the six targeted project teams were solicited via recruitment email directly from executive management without the involvement of the researcher. Participation in the survey was completely voluntary and all responses were confidential. The recruitment email with a link to the web-based survey was distributed on June 28, 2013 (see Appendix A: Pilot Study Recruitment Email Script). Two reminder recruitment emails were distributed directly from executive management for the purpose of increasing participant response rate: the first reminder was distributed on July 8, 2013, and the second reminder was distributed on July 15, 2013. The survey concluded on July 18, 2013.

Of the 91 recruitment solicitations, seventy-eight (78) team members and project managers responded via a web-based survey instrument during normal work hours, representing an 86% response rate. Only fully completed surveys were included in this study analysis and deemed usable. Sixty-four (64) total surveys were deemed usable, representing a 70% response rate. Thus, there were 6 total project manager responses and 58 team member respondents. 45% of respondents were female, while 55% were male. 9% of respondents were African American, 2% were of Hispanic origin, and 88% were Caucasian. Average length of tenure with the company was 13.02 years. 39% of respondents were college graduates, 33% attended college, and 13% were high school graduates. 5% of respondents had attained a graduate degree, while 9% had attended graduate school.

Survey instrument for the pilot study. Project team members and project managers completed survey questionnaires individually, and were asked to rate the team when responding to the survey questions. Respondents were also asked to answer

individual demographic questions such as gender, age, and ethnicity. The pilot study survey questionnaire was adapted from previously validated scale measures of project management complexity, team shared leadership, team political skill, and team effectiveness. The online survey for the pilot study is shown in Appendix B: Pilot Study Online Survey.

Project management complexity was assessed using the CIFTER (Crawford-Ishikura Factor Table for Evaluating Roles), developed by GAPPS, the Global Alliance for Project Performance Standards (Aitken & Crawford, 2007). The CIFTER instrument contains a seven-factor model for assessing the project management complexity of projects. A sample item is "Strategic importance of the project to the organization or organizations involved." The items were rated on a Likert point scale from 1 ("Low or Very Low") to 4 ("High or Very High"). The Cronbach's alpha for the project management complexity scale as calculated in the pilot study was $\alpha = .725$. Appendix C shows the items used to measure project management complexity.

Shared leadership was rated at the team level by using the 26 items from the questionnaire by Hoch et al. (2010), including the factors for transformational, transactional, directive, empowerment (individual), empowerment (team), and aversive leadership behaviors. A sample item is "My team members seek a broad range of perspectives when solving problems." The items were rated on a Likert point scale from 1 ("Definitely Not True") to 5 ("Definitely True"). The Cronbach's alpha calculated for the pilot study for this instrument was $\alpha = .892$. Appendix D shows the items used to measure team shared leadership.

Political skill was rated using the Political Skill Inventory (PSI), an 18-item questionnaire developed to measure political skill at the individual level (Ferris et al., 2005). All items from this 18-item questionnaire were adapted for responses regarding political skill at the team level. A sample item is "My team members spend a lot of time and effort at work networking with others." The items were rated on a Likert point scale from 1 ("Strongly Disagree") to 7 ("Strongly Agree"). The Cronbach's alpha calculated for the pilot study for the political skill inventory scale was $\alpha = 0.914$. Appendix E shows the items used to measure team political skill.

Team effectiveness was rated at the team level using a scale developed by Pearce and Sims (2002). The team effectiveness scale was developed with 26 items to assess output, quality, change, organizing and planning, interpersonal, value, and overall effectiveness. A sample item is "The team delivers its commitments on time." The items were rated on a Likert point scale from 1 ("Definitely Not True") to 5 ("Definitely True"). The Cronbach's alpha calculated for the pilot study for the political skill inventory scale was $\alpha = 0.962$. Appendix F shows the items used to measure team effectiveness.

Data analysis for the pilot study. Hierarchical multiple regression analysis using SPSS was the primary method used for testing the three pilot study hypotheses. Regression analysis was chosen as the method for this study in order to determine whether the independent variables influenced and predicted the continuous dependent variable, team effectiveness, in the hypotheses. Confirmatory factor analysis (CFA) was performed using LISREL for the purpose of evaluating model fit for project management complexity, shared leadership, political skill, and team effectiveness.

Results of the pilot study.

General Descriptives

Descriptive statistics for the study variables are displayed in Table 1. To examine item internal consistency and scale reliability of the measurement model, Cronbach's alpha coefficient estimates were considered for the four research variables. All research instruments were within acceptable reliability, with alpha scores ranging from .725 to .962. Multiple regression was performed with project management complexity, shared leadership, and political skill being predictors and team effectiveness being an outcome variable, and independence of the errors (no serial correlation) was examined to determine whether the residuals are correlated serially from one observation to the next. The Durbin-Watson value = 2.044, indicating that the residuals were uncorrelated. In addition the correlation coefficient r values were within an acceptable range, from .383 to .638; $p < .000$. Multicollinearity did not appear to be violated, as the tolerance values ranged from .724 to .780, and VIF ranged from 1.283 to 1.380.

Table 1. Pilot Study Descriptive Analyses, Item Internal Consistency, and Correlation Coefficient Estimates

Variables	*M*	*SD*	*α*	1	2	3	4
Team Effectiveness	4.241	.482	.962	1			
Project Management Complexity	2.837	.462	.725	.483*	1		
Shared Leadership	3.409	.411	.892	.448*	.383*	1	
Political Skill Inventory	5.467	.652	.914	.638*	.416*	.455*	1

*$p < .01$

Independence of Observations

All measurement scales in this pilot study referred to the team as the unit of analysis, and team members were asked to rate the team rather than respond at an

individual level. To perform team level analysis, it is necessary to justify the aggregation of the individual responses to the team level (LeBreton & Senter, 2008). According to LeBreton and Senter (2008), "when multiple targets are assessed, the empirical support needed to justify aggregation may be acquired via IRA indices such as r_{wg} and via IRR indices such as intraclass correlation coefficients (ICCs)" (p. 817). For the pilot study, multiple targets (teams) were assessed, and the support needed to justify aggregation was examined via interrater agreement (IRA) and interrater reliability (IRR) methods.

The interrater agreement, r_{wg} (James, Demaree, & Wolf, 1984, 1993), was calculated for each scale to index the extent of agreement among lower-level observations. To justify aggregation of responses at the team level, mean r_{wg} values > .70 are considered acceptable (LeBreton & Senter, 2008). The mean r_{wg} values for all four scales were acceptable: Project Management Complexity: r_{wg} = .92; Team Effectiveness: r_{wg} = .91; Shared Leadership: r_{wg} = .94; and Team Political Skill: r_{wg} = .82. The SPSS syntax used to calculate the r_{wg} indices for each scale is shown in Appendix G: Calculation of r_{wg} Indices for Pilot Study.

In addition, intraclass correlation coefficients (ICCs) represent whether the measures are reliable to model effects at the team level (Bliese, 2000). According to Mathieu et al., (2006), "ICC(1) represents the reliability of a single rating of the team construct, whereas ICC(2) represents the reliability of the average of team members' responses" (p. 101). Calculation of the intraclass correlation coefficients for each study variable was attempted using the SPSS analyze scale functionality. For this pilot study, the small number of cases prevented the calculation of the intraclass correlation coefficients in SPSS, indicating too few cases for analysis at the team level. Although

the interrater agreement indices were acceptable, due to the inability to calculate the ICC(1) and ICC(2) values and thus justify aggregation at the team level, the data was analyzed at the individual level.

Confirmatory Factor Analysis

Confirmatory factor analysis was performed to check the construct validity, and model fit indices are summarized in Table 2. The sample size was fairly small (n=64), and therefore the adjusted chi-square (χ^2/df= 1.41) was considered and supports model fit. The model fit indices indicate a good measurement model (RMSEA = .080 and RMR = .0465). The non-normed fit index (NNFI = .949) and the comparative fit index (CFI = .956) also support the model fit. Therefore, the model fit indices indicate acceptable model fit.

Table 2. Pilot Study Results of the Confirmatory Factor Analysis (CFA)

Model Fit Indices	*df*	X^2	X^2/df	RMSEA	RMR	CFI	NNFI
Measurement Model	146	205.29	1.41	.080	.0465	.956	.949

Analysis of Hypotheses

Data was analyzed at the individual level due to the inability to calculate the ICC(1) and ICC(2) values. Multilevel research requires larger sample sizes, in general, than single-level research (Scherbaum & Ferreter, 2009). Each scale consisted of multiple items, and therefore composite scores were calculated for the dependent variable, project team effectiveness, and the three independent variables, project management complexity, shared leadership, and team political skill.

Regression analysis was performed in SPSS to test Hypothesis 1 (Table 3) after checking assumptions. Hypothesis 1 was supported ($\beta = .483$, $p < .01$), indicating that project management complexity positively influences team effectiveness.

Table 3: Pilot Study Regression Results for Testing Hypothesis 1

Predictor	β	R^2	ΔR^2
Testing Step in Regression Model			
		. 233	.233
Outcome: Team Effectiveness Predictor: Project Management Complexity	.483*		

*p < .01

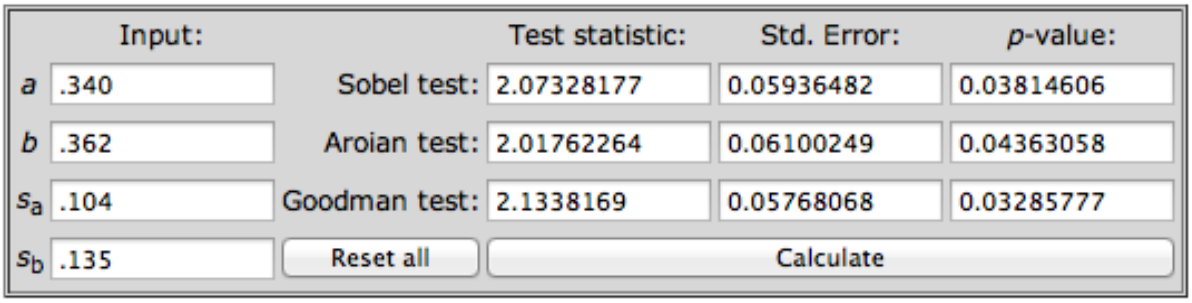
Hypothesis 2 was tested utilizing a four-step regression approach to determine mediating effects of shared leadership on the relationship between project management complexity and team effectiveness (Baron & Kenny, 1986). Table 4 displays the results of the mediation analysis for Hypothesis 2. For Step 1, the results for Hypothesis 1 supported Condition 1, which demonstrated that project management complexity was significantly related to team effectiveness ($\beta = .483$, $p < .01$). In step 2, the relationship between project management complexity and shared leadership was tested, demonstrating that the relationship was significant ($\beta = .383$, $p < .01$). In step 3, the relationship between shared leadership and team effectiveness was tested, demonstrating that the relationship was significant ($\beta = .308$, $p < .01$). Because significant relationships existed from steps 1 through 3, the regression for step 4 was conducted with project management complexity and shared leadership as independent variables, and team effectiveness as the dependent variable. Results of Step 4 showed that the relationship was significant ($\beta = .364$, $p < .01$). Results for Step 1 show that the beta coefficient for the project

management complexity-team effectiveness relationship was β = .483, which is visually larger than the relationship in Step 4, β = .364, indicating partial mediation. To test the statistical difference in the two beta-coefficients, a Sobel test (Preacher & Leonardelli) was performed and was significant (p = .038), indicating that the decrease in the beta-coefficient from the independent variable project management complexity to the dependent variable team effectiveness was significant. Figure 2 displays the results of the Sobel test. Therefore, Hypothesis 2 is supported indicating that the relationship between project management complexity and the dependent variable team effectiveness is partially mediated by shared leadership.

Table 4: Pilot Study Regression Results for Testing Mediation Effects of Shared Leadership in Hypothesis 2

Testing steps in mediation model	*B*	*SE B*	*β*
Testing Step 1			
Outcome: Team Effectiveness Predictor: Project Management Complexity	.503	.116	.483*
Testing Step 2			
Outcome: Shared Leadership Predictor: Project Management Complexity	.340	.104	.383*
Testing Step 3/4			
Outcome: Team Effectiveness Mediator: Shared Leadership	.362	.135	.308*
Predictor: Project Management Complexity	.380	.120	.364*

*p <.01



Input:			Test statistic:	Std. Error:	*p*-value:
a	.340	Sobel test:	2.07328177	0.05936482	0.03814606
b	.362	Aroian test:	2.01762264	0.06100249	0.04363058
s_a	.104	Goodman test:	2.1338169	0.05768068	0.03285777
s_b	.135	Reset all	Calculate		

Figure 2: Pilot Study Results of Sobel Test of Significance of Mediation Effects of Shared Leadership

To assess moderated mediation (Muller, Judd, & Yzerbyt, 2005; Preacher, Rucker, & Hayes, 2007) in Hypothesis 3, four conditions were examined: 1) significant effect of project management complexity on team effectiveness; 2) significant interaction between project management complexity and team political skill in predicting shared leadership, and significant interaction between shared leadership and team political skill in predicting team effectiveness; 3) significant effect of shared leadership on team effectiveness; and 4) demonstration of the difference in the strength of the mediation via shared leadership when team political skill is high versus when it is low.

Table 5 displays the results for the moderated mediation analysis for Conditions 1, 2, and 3. The results for Hypothesis 1 supported Condition 1, which demonstrated that project management complexity was significantly related to team effectiveness ($\beta = .483$, $p < .01$). Results for testing Condition 2 in Table 5 show that the interaction term for project management complexity with political skill was not significant in predicting shared leadership ($\beta = .105$, *ns*) and that the interaction term for shared leadership with political skill was not significant in predicting team effectiveness ($\beta = -.057$, *ns*). Hence, Condition 2 was not satisfied. Condition 3 was supported in the results for Hypothesis 2, in which shared leadership was positively related to team effectiveness ($\beta = .308$ $p < .01$).

Results based upon the first three conditions indicated that team political skill does not moderate the relationship between project management complexity and team effectiveness via shared leadership. Therefore, a test for Condition 4 was not performed, and Hypothesis 3 was not supported.

Table 5: Pilot Study Regression Results for Testing Moderated Mediation in Hypothesis 3

	B	*SE B*	*β*	R^2	ΔR^2	F
Testing Condition 1 Outcome: Team Effectiveness Predictor: Project Management Complexity	.503	.116	.483*	.233	.233	18.819
Testing Condition 2 Outcome: Shared Leadership Predictor: Project Management Complexity X Political Skill	.053	.064	.105	.011	.011	.691
Outcome: Team Effectiveness Predictor: Shared Leadership X Political Skill	-.025	.057	-.057	.003	.003	.199
Testing Condition 3 Outcome: Team Effectiveness Predictor: Shared Leadership	.362	.135	.308*	.314	.314	13.957

*p <.01

Influence of the Pilot Study on the Main Study

The following is a brief summary addressing the influence of the pilot study on the main study:

1. The process of creating and designing the web-based survey, recruiting the pilot study teams, collecting the data, and evaluating and analyzing the data was an invaluable experience in terms of understanding the multilevel

nature of the data, how to best organize the data files, and practice using the tools and techniques for analysis.

2. The reliability and validity of the scale measures were tested, resulting in Cronbach's alphas within acceptable ranges lending increased confidence in the scale measures proposed for the study.

3. The pilot study confirmed the importance of the number of teams that would be needed in order to perform multilevel analysis in the main study. For this pilot study, multilevel analysis at the team level was not performed due to results of the tests of interrater agreement and reliability (Scherbaum & Ferreter, 2009). For this pilot, the hierarchical nature of the data was essentially ignored, and the team level variables were analyzed at the individual level, thereby potentially violating independence of observations and introducing the risk of reporting inaccurate findings (Nimon, 2012). In addition, use of SEM to analyze the hypotheses at the team level was precluded by the small sample size (Schumacker & Lomax, 2010) as SEM is recommended for larger sample sizes. Some multilevel studies have shown that increasing the number of teams for the sample size has a greater impact on increasing power than increasing the number of individuals in the sample; e.g., increasing the number of teams influences power in multilevel models (Scherbaum & Ferreter, 2009).

Design of the Main Study

This study employed a quantitative approach for the purpose of increasing the generalizability of findings within the targeted industries (Bryman & Bell, 2011). A cross sectional survey design was used to collect data from individual team members and project managers regarding the shared team properties of project management complexity, shared leadership, team political skill, and team effectiveness. Shared team properties "originate in experiences, attitudes, perceptions, values, cognitions, or behaviors that are held in common by the members of a team" (Klein & Kozlowski, 2000, p. 215). Due to the multilevel nature of the data (individuals and teams), the study incorporated multilevel modeling analysis techniques (Klein & Kozlowski, 2000). The study was grounded in multiple conceptual frameworks, including the IMOI model of team effectiveness (Ilgen et al., 2005), the theory of shared leadership (Pearce & Sims, 2000), the political skill inventory construct (Ferris et al., 2005), and the construct of project management complexity (Aitken & Crawford, 2007).

Sample Selection and Criteria

Project teams from organizations in six related industries were sought for this study. The project teams were comprised of team members and project managers from each team. The six related industries included consumer packaged goods, logistics, manufacturing, retail, retail consulting, and wholesale. The work of the recruited project teams in each company was performed primarily in a central location and face-to-face, rather than virtually, although some work may have been supported by electronic communications and email.

The rationale for selection of the six industries, and the seventeen companies in these industries included in this study, was twofold. The first rationale was that project teams are important to companies in these industries due to the global, competitive, and complex environments of companies involved in the supply chain. The second was the access available to the researcher via professional relationships within the selected companies.

The companies included in this study were from industries that are considered to be involved in processes and activities for production of materials, and moving these materials forward for final delivery to a customer; i.e. firms involved in supply chain activities. According to Mentzer, DeWitt, Keebler, Min, Nix, Smith, and Zacharia (2001), a "supply chain is defined as a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer" (p. 4). The management of supply chains is considered complex: "Organizations require supply chain managers who understand how to lead diverse employee groups in complex, multi-cultural environments, building teams and managing people by effectively communicating effective and socially responsible messages to multiple stakeholders" (Stank, Dittmann, & Autry, 2011, p. 943). In their analysis of supply chain management practices, Paulraj, Chen, and Lado (2012) identify the use of cross-functional teams within organizations as critical to solving problems and addressing complex issues. Stank et al. (2011) identify five pillars of supply chain excellence, with the fifth pillar being the management of change, and that careful attention should be made to change and project management.

Two strategies were employed to recruit project teams in companies in these industries. The first strategy employed was contacting administrative members of multiple professional industry organizations. These professional organizations were the Project Management Institute (PMI), the Food Marketing Institute (FMI), and the Council of Supply Chain Management Professionals (CSCMP). The second strategy employed was placing phone calls and other means of electronic and personal communications to the researcher's professional contacts within targeted organizations. These strategies resulted in recruiting a greater number of project teams from multiple organizations within the selected industries.

The constructs of interest in this study were meaningful at the team level; therefore, multilevel analysis was employed (Klein & Kozlowski, 2000). In order to conduct multilevel research, it was important to consider the sample size required to accurately analyze the multilevel model and to estimate the results (Tabachnik & Fidell, 2013). Because the study analyzed shared team properties, it was necessary for the sample to contain "sufficient between-unit variability to assess the effects of unit differences and, when testing the effect of shared unit properties, sufficient within-unit homogeneity to warrant aggregation of lower level data to the unit level" (Klein & Kozlowski, 2000, p. 220). Some multilevel studies have shown that increasing the number of teams for the sample size has a greater impact on increasing power than increasing the number of individuals in the sample (Scherbaum & Ferreter, 2009). For purposes of this study, the researcher targeted a sample size with a minimum of 30 teams and a range of 5 to 20 members within each team (Scherbaum & Ferreter, 2009; Tabachnik & Fidell, 2013). The researcher also targeted an equal number of teams

within the selected industries. The researcher ultimately recruited 30 teams from seventeen companies within the six industries. These teams were comprised of 308 total team members (including respective team project managers), resulting in an average of 10.27 team members per team.

Instrumentation

The cross sectional survey instrument was constructed from previously validated measures of project management complexity, shared leadership, political skill, and team effectiveness, therefore increasing the potential to replicate the study. These measures were previously described in the "Survey instrument for the pilot study" section in Chapter 3. The approach for the study was "rating the team" (Gockel & Werth, 2010, p. 172), as the measures were designed for responses from a team level perspective. Respondents were asked to rate the team when responding to the survey questions. For collection of data for relevant control variables, the cross sectional survey instrument also contained individual demographic questions including gender, age, ethnicity, total length of employment at the company, highest level of education, project role, length of time on the project, and management role in the company. All team members answered questions regarding company industry, size of the organization, and team size.

Project management complexity. Project management complexity was assessed using the CIFTER (Crawford-Ishikura Factor Table for Evaluating Roles), developed by GAPPS, the Global Alliance for Project Performance Standards (Aitken & Crawford, 2007). In the validation of this scale, Aitken and Crawford (2007) reported a Cronbach's alpha of .69. According to Aitken and Crawford (2007), "the corrected item-total correlation for Factor 6 - Stakeholder Cohesion is below 0.3, indicating that it is

measuring something different than the scale as a whole" (p. 8). With removal of item 6, $\alpha = 0.733$ (Aitken & Crawford, 2007).

Shared leadership. Shared leadership was rated at the team level by using the 26 items from the questionnaire by Hoch et al. (2010). Hoch et al. (2010) reported a Cronbach's alpha of 0.85.

Political skill. Political skill was rated using the Political Skill Inventory (PSI), an 18-item questionnaire developed to measure political skill at the individual level (Ferris et al., 2005). In their validation of the PSI scale, Ferris et al. (2005) reported a Cronbach's alpha of 0.89. The team level adaptation to this questionnaire was tested in the pilot study and resulted in a Cronbach's alpha of $\alpha = 0.914$.

Team effectiveness. Team effectiveness was rated at the team level using a scale developed by Pearce and Sims (2002). Pearce and Sims (2002) reported a Cronbach's alpha of 0.98 for the team effectiveness scale.

Approaches to Data Collection

Company management for each project team identified project team members and project managers that participated in the study. Study participants from each project team were recruited via email from respective company management and were informed that taking part in the survey was voluntary and that all responses would be confidential. The researcher had no involvement in collecting email addresses, no knowledge of team member identities, nor any participation in delivery of the recruitment emails, essentially removing the researcher from the recruitment process. Participants accessed a web-based survey through a link in the email for the purpose of encouraging a high response rate. The survey was designed so that participants were able to exit the survey at any time.

Approaches to Data Analysis

Data analysis for this study was performed using SPSS and LISREL. Hierarchical multiple regression using SPSS was the method of analysis to examine the relationships among the study variables. Indirect effect, or mediation, occurs when the effect of an independent variable on a dependent variable is transmitted via a mediator (Preacher et al., 2007). For Hypotheses 1 and 2, the mediation variable, shared leadership, was tested for indirect effects on the relationship between project management complexity (independent variable) and team effectiveness (dependent variable). For Hypotheses 3, the study examined the moderating effects of the continuous independent variable, team political skill, to determine the strength of the relationship between project management complexity and team effectiveness mediated by shared leadership.

Independence of Observations

To perform unit analysis at the team level, it was necessary to justify the aggregation of the individual-level data to the team level to represent the shared team properties (LeBreton & Senter, 2008). As indicated by LeBreton and Senter (2008), "When multiple targets are assessed, the empirical support needed to justify aggregation may be acquired via IRA indices such as r_{wg} and via IRR indices such as intraclass correlation coefficients (ICCs)" (p. 817). For this study, multiple targets (teams) were assessed, and the support needed to justify aggregation was examined via interrater agreement (IRA) and interrater reliability (IRR) methods.

Interrater agreement, r_{wg} (James et al., 1984, 1993), was calculated for each scale to index the extent of agreement among lower-level observations. To justify aggregation

of responses at the team level, mean r_{wg} values > .70 are considered acceptable (LeBreton & Senter, 2008). In addition, intraclass correlation coefficients (ICCs) represent whether measures are reliable to model effects at the team level (Bliese, 2000). According to Mathieu et al. (2006), "ICC(1) represents the reliability of a single rating of the team construct, whereas ICC(2) represents the reliability of the average of team members' responses" (p. 101). SPSS was used to calculate the ICC(1) and ICC(2) for each study variable.

Reliability and Validity

Item internal consistency and construct validity was examined using Cronbach's alpha coefficient estimates and correlation coefficients. An alpha coefficient may be computed to be "between 1 (denoting perfect internal reliability) and 0 (denoting no reliability)" (Bryman & Bell, 2011, p. 159). The measures used in the study were previously empirically tested with Cronbach's alphas of .70 or better, with the exception of the project management complexity measure. This measure was tested in the pilot study, resulting in an acceptable Cronbach's alpha of $\alpha = 0.725$. To validate model fit, confirmatory factor analysis (CFA) using LISREL was employed for all study variables (Schumacker & Lomax, 2010).

A potential source of common method bias may be due to "the fact that the predictor and criterion variables are obtained from the same source or rater" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003, p. 881). To procedurally address this issue, the survey was designed so that project managers rated team effectiveness, while both project managers and team members rated the team on project management complexity, shared leadership, and team political skill.

Assumptions and Limitations

Research requires certain assumptions to be made by the researcher. In addition, limitations may be inherent due to the nature of the study. Research may also incur a number of associated risks during employment of the study. The assumptions and limitations of the study are described below.

Assumptions

The study was based upon the following assumptions:

1.) It is more important in multilevel analysis to collect a larger number of teams than larger numbers of individual team respondents within each team. The assumption is that the researcher has retained a sufficient number of teams to perform the analysis necessary for testing the hypotheses and performing the multilevel analysis. For this study, the target number of teams was a minimum of thirty, with five to twenty team members in each team, including project managers and sponsors. Communications with officers and members of project management professional organizations, as well as communications with the researcher's contacts, were utilized to recruit a sufficient number of teams for the study.

2.) Due to the multilevel nature of the data collected, it was assumed that multilevel analysis would be performed utilizing the techniques described in this study.

Limitations

The study includes the following limitations:

1.) A limitation of the research was the possibility of low response rate. The response rate for the pilot study was, 70%, likely due to additional effort by the researcher and the executive management to send email reminders weekly to the recruited project team members and project managers. The researcher employed similar methods for reminders for the main study in order to achieve an acceptable response rate.

2.) A second limitation, and potential risk, for the study was the difficulty of measuring and modeling influences of shared leadership and politics at the team level. Use of multi-level data (individual responses aggregated to the team level) required the researcher to make choices for research regarding the nature of the shared team properties, predicted construct relationships, sample sizes, and analysis procedures (Klein & Kozlowski, 2000). This study assessed these processes and behaviors at the team level, requiring the team member or project manager respondents to rate the team as a whole.

3.) A third limitation of the study was that generalization of results may only be applied to the industries represented in this study.

Summary of Chapter 3

Chapter 3 has provided an overview of the design and methods used to examine the influence of shared leadership and political skill on the relationship between project management complexity and team effectiveness. It has presented the research questions and hypotheses for the study. It has summarized an initial pilot study, and the influence of the pilot study on the main study research approach. It has articulated the design and rationale for the design choice, and outlined the approaches for sampling, data collection,

and data analysis procedures. Issues associated with reliability and validity were addressed. Lastly, assumptions and limitations were described.

Chapter 4 - Findings

Introduction

This chapter presents the results from the analysis of the data collected in support of this study and is organized into three main sections: data collection and sample characteristics; assumptions, reliability, and validity; and, examination of the hypotheses. The chapter concludes with a summary.

Data Collection and Sample Characteristics

Participants and Procedures

The researcher contacted company executives of 32 U.S. and global organizations within six targeted industries to recruit project teams for the study. The six industries were: consumer product goods (CPG), logistics, manufacturing, retail, retail consulting, and wholesale. Seventeen companies agreed to participate, resulting in a 53% participation rate.

The target sample size for this study was 30 teams and a minimum of 5 members per team (Scherbaum & Ferreter, 2009; Tabachnick & Fidell, 2013). Thirty project teams were recruited to participate in the study. Recruited project team size ranged from 5 to 30 members, with an average of 10.27 members per team.

The project teams were cross-functional in nature and were comprised of members from various operating business units within the companies. Team members reported directly to functional and operational managers, although they also reported to a project team manager for the duration of the project. Team members were unique to each

project in that no project team member responded to more than one survey. Table 6 presents a summary of project team demographics within each industry, including the number of participating companies, whether the companies were global or strictly located within the U.S., number of project teams, and examples of project type.

Table 6. Summary of Project Team Demographics within Industry

Industry	Participating Companies	Global/US Company	Number of Project Teams	Examples of Project Types(s)
CPG	4	Global	6	Human Resources, Merchandising, Sales Force
Logistics	3	Global	5	Continuous Improvement, New Client Startup
Manufacturing	4	Global	5	Process Improvement, Container Selection, Software Implementation
Retail	5	US	10	New Store Opening, Inventory, Charity Event, Construction
Retail Consulting	2	Global	3	Software Implementation
Wholesale	1	Global	1	Software Implementation
Totals	17		30	

Note. A total of 17 companies participated in the study. One company provided teams for two different industries.

Members of each project team were contacted directly by the company executive contact via recruitment emails without involvement of the researcher. The recruitment emails contained a link to the web-based survey and were distributed beginning February

24, 2014 (see Appendix H: Main Study Recruitment Email Script). Participation in the survey was completely voluntary and all responses were confidential. To increase response rate, company executive contacts sent two reminder emails to members of each team. The reminder emails were distributed beginning March 2, 2014, and the online survey links were closed on April 15, 2014.

The 30 recruited teams consisted of 308 total solicitations (30 project managers and 278 project team members). Of the 308 solicitations, a total of 243 (inclusive of project managers and project team members) responded, representing a response rate of 78.9%. Survey responses for each scale were required, although the survey was designed such that participants had the option to withdraw at any point in time. Only fully completed surveys were deemed usable for the study analysis and incomplete surveys were eliminated from further analysis. Of the 243 responses returned, 209 were deemed usable (67.9% response rate relative to solicitation), with 30 project manager responses (100% response rate relative to solicitation), and 179 project team member responses (64.4% response rate relative to solicitation). Thirty-four surveys were deemed unusable (11.0% response rate relative to solicitation).

Nonresponse bias can occur when the perceptions of survey respondents differ significantly from those who do not respond (Armstrong & Overton, 1977). Nonresponse bias was examined by comparing the responses of early responders to late responders. According to Armstrong and Overton (1977), "persons responding later are assumed to be more similar to nonrespondents" (p. 397). An independent t-test was performed to examine possible differences between early respondents who completed a survey upon receiving the original survey email and late respondents who completed a survey after

receiving the first email reminder (Armstrong & Overton, 1977). This test compared means of the four key study variables in the group containing the early respondents and the group containing the late respondents. The results of t-tests for equality of means for all study variables were not significant: project management complexity (t = .351, df = 207, p = .726); team effectiveness (t = -1.532, df = 207, p = .127); shared leadership (t = .229, df = 207, p = .819); political skill (t = -1.090, df = 207, p = .277). This indicated that the early respondents and the late respondents did not differ significantly in their responses, suggesting that non-response bias was not a major concern for this study.

Each project manager and project team member completed the survey individually, but assessed their perspectives on the team level. The questionnaire was constructed from previously validated scale measures of project management complexity, shared leadership, political skill, and team effectiveness. The online survey for the study is shown in Appendix I: Main Study Online Survey. Survey participants also reported company and team level demographics, including industry, company size, and size of the project team. Participants reported individual demographics, such as gender, age, ethnicity, organizational tenure, education, number of months served on the project team, and whether the participant was a supervisor within the company.

Seven (3.3%) of the participants chose not to report the demographic information. Seventy-two participants (34.5%) were female, and 129 (61.7%) were male. Ten participants (4.8%) were African American, four participants (1.9%) were Asian or Pacific Islander, 176 participants (84.2%) were Caucasian, nine participants (4.3%) were of Hispanic origin, and two (0.9%) reported their ethnicity as "other". Ten participants (4.8%) had been with their company less than one year, 46 participants (22.0%) between

1 and 5 years, 46 participants (22.0%) between 5 and 10 years, 46 participants (22.0%) between 10 and 20 years, and 53 participants (25.4%) over 20 years. Forty-one participants (19.6%) had attained a graduate degree, 14 participants (6.7%) had attended graduate school, 82 participants (39.2%) were college graduates, 49 participants (23.4%) had attended college, and 15 participants (7.2%) were high school graduates.

Control Variables

Six variables were included as controls in the analysis: industry, ethnicity, age, team member time with the company, team size, and team member time on the project. Industry was included as a control variable as it is viewed as an external environmental characteristic with the potential to influence team effectiveness (Cohen & Bailey, 1997; Daspit et al, 2013).

Four of the variables, ethnicity, age, team member time with the company, and team size, are team composition variables with the potential to influence team effectiveness (Cohen & Bailey, 1997). According to Campion, Medsker, and Higgs (1993), "heterogeneity in terms of abilities and experiences has been found to have a positive effect on performance (p. 828). In addition, previous research has shown that team member diversity may influence team effectiveness (Carson et al, 2007; Daspit et al., 2013). Therefore, ethnicity and age were included as control variables. Size of the teams varied greatly from 5 to 30 team members, with the potential to influence workload requirements, and was thus included as a control variable (Carson et al, 2007; Fausing, Jeppesen, Jønsson, Lewandowski, & Bligh, 2013). In addition, previous research has shown that team member length of time with the company may have an influence on team performance due to the ability to contribute experience and knowledge of the

company to team functions and processes (Fausing, et al., 2013). Team member time with the company also varied greatly in this study, ranging from less than one year to over 20 years, and therefore was included as a control variable.

Survey items required team members to rate the team as a whole, rather than to rate themselves or individual team members on perceptions of behaviors and effectiveness. According to Gockel and Werth (2010), "only if team members have been working together for a longer period are they able to assess to what extent others show the behaviors of interest" (p. 180). Therefore, team member length of time on the project was included as a control variable.

Assumptions, Reliability, and Validity

Assumptions Testing

Preliminary analysis was performed to test underlying assumptions for regression analysis, including linearity, normality, homoscedasticity, and multicollinearity.

Linearity. The assumption of linearity indicates that the relationship between the independent and dependent variables is linear (Cohen, Cohen, West, & Aiken, 2003). An examination of the normal probability plot of the observed and the predicted values showed the points distributed symmetrically around the diagonal line, indicating no violations of linearity.

Normality. Calculation of significance tests are based upon the assumption of normally distributed errors (Cohen et al., 2003). The Shapiro-Wilk's test was analyzed to assess normality of the data, due to the relatively small sample size (n = 209). Examination of the significance values of the Shapiro-Wilk's test indicated that data was

normally distributed, as the majority of these values were greater than .05. Q-Q plots were also examined and data points were clustered around the diagonals.

Homoscedasticity. Homoscedasticity is the assumption of constant variance of the errors; i.e., homogeneity of variances (Cohen et al., 2003). The Levene's statistic was examined for the dependent and independent variables. The value for Levene's statistic test was non-significant, supporting homogeneity of variances.

Multicollinearity. Multicollinearity indicates that correlations among the independent variables in the model are strong; i.e. multicollinearity inflates the standard errors, and may distort the significance statistics (Cohen et al., 2003). The variance inflation factor (VIF) is used as an indicator of multicollinearity in multiple regression analysis. Hair, Black, Babin, and Anderson (2009) suggest that VIFs greater than 10.0 indicate that multicollinearity may be a problem. The VIFs in the regression model are less than 10, ranging from 1.151 to 3.044, confirming that there was little evidence of multicollinearity in this study.

Descriptive Statistics and Scale Reliabilities

Means (M), standard deviations (SD), Cronbach's alpha for each measurement scale, and correlations of the four key research variables and six control variables are presented in Table 7. All measurement scales in this pilot study referred to the team as the unit of analysis, and team members and project managers were asked to rate the team on shared team properties rather than to respond at an individual level. To examine item internal consistency and scale reliability of the measurement model, Cronbach's alpha coefficient estimates were considered for the four research variables. All research

instruments were within acceptable reliability, with alpha scores ranging from .806 to .948.

Project Management Complexity. Project management complexity was assessed at the team level using the seven items of the CIFTER scale (Crawford-Ishikura Factor Table for Evaluating Roles), developed by GAPPS, the Global Alliance for Project Performance Standards (Aitken & Crawford, 2007). The Cronbach's alpha for the project management complexity scale was $\alpha = 0.806$.

Shared Leadership. Shared leadership was rated at the team level by using the 26 items from the questionnaire by Hoch et al. (2010). The Cronbach's alpha for the shared leadership scale was $\alpha = .908$.

Political Skill. Political skill was rated using the Political Skill Inventory (PSI), an 18-item questionnaire developed to measure political skill at the individual level (Ferris et al., 2005). All items from this 18-item questionnaire were adapted for responses regarding political skill at the team level. The Cronbach's alpha for the political skill inventory scale was $\alpha = .929$.

Team Effectiveness. Project managers assessed team effectiveness at the team level using a scale developed by Pearce and Sims (2002). The team effectiveness scale was developed with 26 items to assess output, quality, change, organizing and planning, interpersonal, value, and overall effectiveness. The Cronbach's alpha for the team effectiveness scale was $\alpha = 0.948$.

Table 7. Descriptive Analyses, Item Internal Consistency, and Correlation Coefficient Estimates

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Team Effectiveness[a]	4.254	.434	(.948)									
2. Project Management Complexity[b]	2.861	.303	.260**	(.806)								
3. Shared Leadership[b]	3.402	.217	.184**	.070	(.908)							
4. Political Skill[b]	5.404	.370	.313**	-.027	.629**	(.929)						
5. Industry	3.06	2.221	-.183**	-.547**	.268**	.300**	-					
6. Ethnicity	3.919	.327	-.390**	.200**	-.053	-.213**	-.026	-				
7. Age	3.263	.564	-.033	-.169*	-.249**	-.192**	.140*	.058	-			
8. Time with Company	3.431	.772	.343**	-.006	-.151*	.249**	-.119	-.070	.540**	-		
9. Team Size	1.88	.976	.196**	.310**	-.173*	-.171*	-.465**	.105	-.100	.120	-	
10. Time on Project	3.077	.886	.213**	.084	-.064	-.036	.071	-.043	.047	-.121	-.284**	-

Note. N = 30 teams. Cronbach's alphas are reported diagonally in parentheses.
[a]Ratings provided by project team managers. [b]Ratings provided by all team members.
*p < .05. **p < .01.

Independence of Observations for Multilevel Analysis

The measurement scales in this study referred to the team as the unit of analysis, and therefore team members were asked to rate the team on shared team properties rather than respond with perceptions at an individual level. To perform team level analysis, it is necessary to justify the aggregation of the individual responses to the team level (LeBreton & Senter, 2008). According to LeBreton and Senter (2008), "when multiple targets are assessed, the empirical support needed to justify aggregation may be acquired via IRA indices such as r_{wg} and via IRR indices, such as intraclass correlation coefficients (ICCs)" (p. 817). Multiple targets (teams) were assessed in this study, and the support needed to justify aggregation was examined via interrater agreement (IRA) and interrater reliability (IRR) methods. The analyses for IRA and IRR were performed for the project management complexity, shared leadership, and political skill inventory scales, as these measurements were observed at the team member level. Project managers rated team effectiveness, and therefore aggregation of the team effectiveness variable to the team level was not required.

Interrater Agreement. The interrater agreement, r_{wg} (James et al., 1984, 1993), was calculated for the project management complexity, shared leadership, and political skill inventory scales to index the extent of agreement among lower-level observations. To justify aggregation of responses at the team level, mean r_{wg} values $> .70$ are considered to indicate a strong agreement among team members (LeBreton & Senter, 2008). The mean r_{wg} values for the three scales indicated a strong agreement: Project Management Complexity: $r_{wg} = .89$; Shared Leadership: $r_{wg} = .92$; and Team Political

Skill: r_{wg} = .81. The SPSS syntax used to calculate the r_{wg} indices for each scale is shown in Appendix J: Calculation of r_{wg} Indices for Main Study.

Interrater Reliability. Intraclass correlation coefficients (ICCs) represent whether the measures are reliable to model effects at the team level (Bliese, 2000). According to Mathieu et al. (2006), "ICC(1) represents the reliability of a single rating of the team construct, whereas ICC(2) represents the reliability of the average of team members' responses" (p. 101). According to LeBreton and Senter (2008), values of ICC(1) > .25 represent a larger "extent to which individual ratings are attributable to group membership" (p. 838). In addition, it is recommended that values of ICC(2) > .70 are sufficient to justify aggregation of team member responses to the team level. ICCs were analyzed for the project management complexity, shared leadership, and political skill inventory scales based upon one-way random effects analysis of variance. Analysis of variance *F* values were significant ($p < .01$) for all scales: shared leadership, ICC(1) = .409 and ICC(2) = .917; project management complexity, ICC(1) = .066 and ICC(2) = .529; political skill inventory, ICC(1) = .555 and ICC(2) = (.952).

In sum, IRA indices (r_{wg}) for each scale indicated a strong agreement among team members, with the ICC(1) and ICC(2) values within acceptable ranges, thus justifying the aggregation of the responses to team level.

Discriminant and Convergent Validity

Discriminant Validity. To assess discriminant validity of the study variables, confirmatory factor analysis (CFA) was performed utilizing LISREL 9.10 (Jöreskog & Sörbom, 2013). Model fit indices are summarized in Table 8.

Table 8. Confirmatory Factor Analysis (CFA)

Model Fit Indices	*df*	X^2	*p*	X^2/df	RMSEA	RMR	CFI	NNFI
1. Four-factor Measurement Model	246	659.30	0.00	2.68	.09	.04	.90	.89
2. Three-factor (combined shared leadership and political skill)	249	788.49	0.00	3.17	.10	.04	.87	.86
3. Single-factor	252	1948.93	0.00	7.73	.18	.08	.59	.55

Model 1 is the four-factor study measurement model in which each individual item was loaded onto its higher order factor (project management complexity, shared leadership, political skill, and team effectiveness). Several recommended indices of goodness of fit were evaluated, including the ratio of chi-square to degrees of freedom (X^2/df), the root mean square error of approximation (RMSEA), the root mean residual (RMR), the comparative fit index (CFI), and the non-normed fit index (NNFI) (Hair et al., 2009). As indicated in Table 7, the adjusted chi-square (χ^2 /*df*= 2.68) was considered and supports model fit. The hypothesized four-factor model fit the data well (X^2 = 659.30; *df* = 246; *p* = 0.00; CFI = .90; NNFI = .89; RMSEA = .09).

To assess discriminant validity of the measurement model, the hypothesized model was compared to two alternative models (Table 8). Political skill is considered an important dimension of leadership in organizations (Ahearn et al., 2004; Ferris et al., 2005). Therefore, the hypothesized model was compared with a three-factor alternative model 2 with shared leadership and political skill loaded onto one factor. The results for model 2 showed an unacceptable fit (X^2 = 788.49; *df* = 249; *p* = 0.00; CFI = .87; NNFI = .86; RMSEA = .10). Alternative model 3 was tested loading all items onto one single latent factor. The results for model 1 showed poor fit (X^2 = 1948.93; *df* = 252; *p* = 0.00;

CFI = .59; NNFI = .55; RMSEA = .18). Overall, the tests of the alternative models indicate superiority of the hypothesized four-factor measurement model.

Convergent Validity. Utilizing LISREL 9.10 (Jöreskog & Sörbom, 2013), the convergent validity of the constructs in the study were verified by examining the factor loadings, average variances extracted (AVE), and composite reliabilities (CR). The composite reliabilities and average variances extracted for the study constructs were as follows: (team effectiveness, CR = .90, AVE = 57.31%; project management complexity, CR = .82, AVE = 39.13%; political skill, CR = .87, AVE = 63.35%; shared leadership, CR = .83, AVE = 41.47%). The CR levels for the constructs were well above the recommended level of .60. The AVE's for the shared leadership and project management complexity constructs were slightly lower than the recommended level of .50 (Hair et al., 2009). All factor loadings for the four constructs were greater than .5 and had significant t-values, with the exception of one item indicator: aversive leadership in the shared leadership factor (t = 1.48). Due to low factor loading for aversive leadership, and to potentially increase the lower than recommended AVE, the aversive leadership item was dropped from the model and all indices recalculated. Removal of this item resulted in a slight improvement in the AVE though still below the .50 recommendation (49.52%). Removal of the item also showed a decrease in the CR (.82) for the shared leadership construct, and slightly lower fit indices for the overall model measurement (X^2 = 616.38; df = 224; X^2/df = 2.75; p = 0.00; CFI = .90; NNFI = .89; RMSEA = .09). Due to the lower fit indices of the measurement model without the item, the aversive leadership item was retained in the model.

Despite the slightly lower than recommended AVEs for the project management complexity and shared leadership constructs, both were retained in the study. According to Brahma (2009), "Deletion of any item may lead to a lack of content validity problem or under-identification in the measurement model. Both these issues must always be considered when eliminating items from a scale" (p. 87). Although dropping items from these scales may potentially increase the AVE, consideration was given to ensure that all items in the two scales adequately reflected the constructs. According to Ping (2004), "Because acceptably reliable measures can contain more than 50% error, in UV-SD model tests a measure's reliability should probably be higher than Nunnally's (1978) suggestion of .7 to avoid a low AVE. While there is no firm rule, measure reliability should probably be .8 or more" (p. 131). The CR levels for all constructs ranged from .82 to .90, well above the recommended level of .60 (Ping, 2004; Bettencourt, 2004; Brahma, 2009). In general all study factors demonstrated convergent validity.

Common Method Bias

Common method bias is the variance that results from the measurement method used in the research rather than the variances resulting from the construct measures and may distort research findings (Podsakoff et al., 2003). Two procedural remedies were employed to minimize and/or eliminate common method bias in this study, including collecting data from multiple sources and protecting the survey respondent confidentiality. In addition, two tests were performed to analyze the level of common method variance potentially present in the data: Harman's single-factor method and the common latent factor test using confirmatory factor analysis (Podsakoff et al., 2003).

One potential source of common method variance in administration of self-report surveys is the use of common raters; i.e., the raters of the predictor and outcome variables are the same. To minimize the bias from common raters in this study, project manager ratings were used for the outcome variable, team effectiveness. The role of the project manager in a project context is that of a single, hierarchical leader, typically leading the project team by controlling, tracking, and implementing phases, steps, or patterns (Carden & Egan, 2008). Therefore, although all survey participants responded to all survey questions, the perceptions of the project managers on team effectiveness were appropriately used to measure the outcome variable and to limit potential common method bias.

Additionally, to ensure confidentiality of test results, all respondents received an invitation to participate in the survey via an email directly from the executive company contact, removing the researcher from the survey process. The emails were blind copied to team members to protect their identities from other company executives and other members of the same team. The respondents were also encouraged to answer the questions honestly.

Harman's single factor test was performed on the observed data to statistically assess common method bias (Podsakoff et al., 2003). Results of Harman's one-factor test for the current study indicated that team effectiveness emerged and accounted for 22.28% of the variance, well below the accepted average of 40.7 % (Cote & Buckley, 1987).

To support the results of Harman's single-factor test, the hypothesized four-factor model was re-estimated with all indicator variables loading onto a common latent factor (Podsakoff et al., 2003). The model including the common latent factor resulted in a

reduced model fit (X^2 = 2929.56; p = 0.00; CFI = .35; NNFI = .17; RMSEA = .24). In addition, many of the individual path coefficients representing the relationships between the indicators and the common latent factor were non-significant.

In summary, the potential for common method bias was addressed with two procedures. The results of the Harman's single factor and the common latent factor tests also provided statistical evidence of a low threat of common method bias for this study.

Influence of Control Variables on Team Effectiveness

Findings from the study indicate that a significant negative correlation exists between industry and team effectiveness (r = -.183), although industry was not significant as a partial effect in the mediation model (ß = .0048, t = 0.3602, p = .7191). Findings also show that industry was not significant in the moderation model (B = -.0082, t = -.4989, p = .6184). These results are contrary to previous conceptual research suggesting that project team performance and effectiveness may be influenced by differences in industry (Cohen & Bailey, 1997; Daspit et al., 2013; Yang et al., 2011).

The remaining four control variables showed significant partial effects on the dependent variable in the mediation model. Individual demographics of years worked at the company and time on the project were most strongly correlated with team effectiveness: r = .343 and r = .213, respectively. These two variables also showed higher partial effects on team effectiveness in the measurement model. Ethnicity and age of team members, although significant in showing partial effects on team effectiveness, showed weak and negative correlations with team effectiveness: ethnicity (r = -.390) and age (r = -.033).

Hypotheses Testing

The analyses were performed to examine the direct relationship between project management complexity and team effectiveness, the mediating (indirect) effects of shared leadership on the relationship between project management complexity and team effectiveness, and the moderating (conditional indirect) effects of project management complexity on team effectiveness through shared leadership, depending upon the level of political skill in the team.

Mediation occurs when a direct causal effect of an independent variable on a dependent variable is transmitted via a mediator (Barron & Kenny, 1986; Preacher et al., 2007). Mediation is also known as an indirect effect (Preacher et al., 2007). According to Edwards and Lambert (2007), "moderation occurs when the effect of an independent variable on a dependent variable varies according to the level of a third variable, termed a moderator variable, which interacts with the independent variable" (p. 1). The strength of a mediation, or indirect, effect may depend upon a moderator variable (Preacher et al., 2007). According to Preacher et al. (2007), a conditional indirect effect is defined as "the magnitude of an indirect effect at a particular value of a moderator" (p. 186). To test the hypothesized mediation and moderation relationships, regression-based path analysis was conducted with the use of two SPSS-based macros provided by Preacher and Hayes (2004, 2007). The macros were also used to generate bootstrap confidence intervals and estimates of regression coefficients.

Test of Mediation

Collectively, Hypotheses 1 and 2 comprised an indirect effects model for simple mediation, positing that the positive relationship between project management

complexity and team effectiveness is transmitted via the mediator, shared leadership. Table 9 presents the results of Hypotheses 1 and 2. Hypothesis 1 posits that project management complexity will positively influence team effectiveness. As the results show, team effectiveness is positively influenced by project management complexity, indicated by the significant regression coefficient (B = .298, t = 3.227, p = .0015). Therefore, Hypothesis 1 is supported in this study.

In support of Hypothesis 2, project management complexity was found to have a significant direct effect on shared leadership (B = .239, t = 4.324, p = .0000). In addition, a significant direct effect existed between shared leadership and team effectiveness (B = .472, t = 4.188, p = .0000). To further validate the results of the hypothesis, a SPSS process utilized 5000 bootstrap samples, generating 95% bias-corrected confidence intervals (CI) for the indirect effects. The results showed that the CI for the indirect effect did not contain zero (LL = .0473, UL = .2088). Therefore, Hypothesis 2 was supported, demonstrating that shared leadership partially mediates the relationship between project management complexity and project team effectiveness.

Table 9. Results of Mediation Analysis (Hypotheses 1 and 2)

Variable	*B*	*SE*	*t*	*p*
Direct and Total Effects				
Step 1: Direct effect of project management complexity on team effectiveness	.2977	.0923	3.2268	.0015
Step 2: Direct effect of project management complexity on shared leadership	.2390	.0553	4.3239	.0000
Step 3: Direct effects of shared leadership on team effectiveness	.4716	.1126	4.1883	.0000
Step 4: Total effect of project management complexity on team effectiveness	.4104	.0918	4.4706	.0000
Bootstrap results for indirect effects				
	M	SE	LL 95% CI	UL 95% CI
Indirect Effect of project management complexity on team effectiveness through shared leadership	.1127	.0420	.0473	.2088

Note. N = 30 teams. LL = lower limit. UL = upper limit. CI = confidence intervals. Bootstrap sample size = 5000

Test of Moderated Mediation

Hypothesis 3 posits that team political skill will moderate the strength of the mediated relationship between project management complexity and team effectiveness via shared leadership such that the mediated relationship will be stronger under high team political skill than under low team political skill. Moderated mediation occurs when "the strength of an indirect effect depends on the level of some variable, or in other words, when mediation relations are contingent on the level of a moderator" (Preacher et al., 2007, p. 193).

Table 10 presents the results of the analysis for Hypothesis 3. Results indicated that the indirect effect of the interaction term between complexity and political skill on the outcome variable team effectiveness was significant ($B = .7944$, $t = 2.3459$, $p < .05$). The influence of project management complexity on team effectiveness via shared leadership was examined at three values of political skill: the mean (.0298), one standard deviation above the mean (.0172), and one standard deviation below the mean (.0425).

Table 10. Regression Results for Moderated Mediation

Predictor	*B*	*SE*	*t*	*p*
Shared Leadership				
Constant	.0054	.0267	.2032	.8392
Project Management Complexity	.0944	.0459	2.0567	.0410
Team Effectiveness				
Constant	4.1006	.0624	65.7410	.0000
Shared Leadership	.3159	.1655	1.9086	.0578
Political Skill	.1948	.1176	1.6569	.0991
Project Management Complexity X Political Skill	.7944	.3387	2.3459	.0200

Political Skill	Boot Indirect Effect	Boot SE	LLCI	ULCI
Conditional indirect effect at Political Skill = M ± 1 SD				
-1 SD (-.3698)	.0172	.0260	-.0351	.0712
M (.0000)	.0298	.0187	.0026	.0773
+ 1 SD (.3698)	.0425	.0322	.0025	.1274

Note. N = 30 teams. Bootstrap sample size = 5000.

To illustrate Hypothesis 3 results, a plot of the interaction of project management complexity and political skill at one standard deviation above and below the mean displayed in Figure 3 (Aiken & West, 1991). The slope of the relationship between project management complexity and shared leadership was positive and significant for teams high in political skill (ß = .452, t = 2.521, p = .012), and was not significant for teams low in political skill (ß = 1.132, t = -.867, p = .387). Therefore, the strength of shared leadership in the team is higher when the level of political skill is high, whereas it is lower when the level of political skill is low.

To further validate the results of the hypothesis, a SPSS process utilized 5000 bootstrap samples and generated 95% bias-corrected confidence intervals (CI) for the indirect effects with results shown in Table 10. Confidence intervals were examined at one standard deviation below and above the mean of political skill. At one standard

deviation below the mean, the indirect effect contained zero (LL=-.0351, UL = .0712), whereas at one standard deviation above the mean, the indirect effect did not contain zero (LL = .0025, UL = .1274). Therefore, Hypothesis 3 is supported, and the mediating effect of shared leadership on the positive relationship between project complexity and team effectiveness is lower at low levels of political skill, and higher at high levels of political skill.

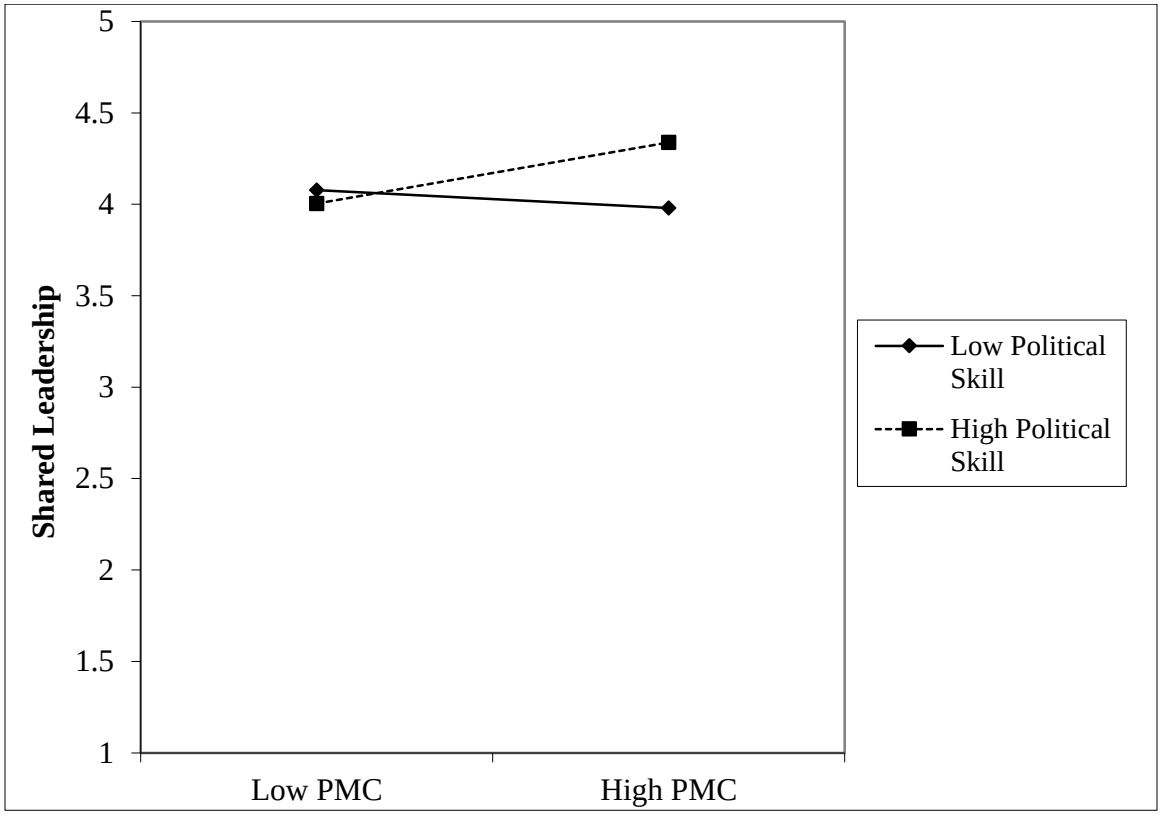


Figure 3. Plot of Interaction between PMC and Political Skill in Predicting Shared Leadership.
Note. PMC = Project Management Complexity. Low = -1 SD below the mean. High = +1 SD above the mean.

Summary

This chapter presented the results from the analysis of data collected from 209 project team members and project managers from 30 project teams in six industries. Data collection procedures and sample characteristics were presented first, followed by a discussion of regression tests assumptions, reliability, and validity of the study measures. Test results showed that there were no violations of the underlying assumptions of linearity, normality, homoscedasticity, or multicollinearity. Cronbach's alphas were calculated and were within acceptable ranges. Next, independence of observations for multilevel analysis and interrater agreement were analyzed. Interrater agreement and reliability indices were within acceptable ranges, justifying the aggregation of individual level responses to the team level for multilevel analysis. Next, discriminant and convergent validity of the study constructs were examined. Confirmatory factor analysis was performed to assess discriminant validity of the study model and tests of two alternative models indicated superiority of the hypothesized measurement model. Convergent validity of the constructs was verified by examining the factor loadings, average variances extracted (AVE), and composite reliabilities (CR). Common method bias was then examined followed by a final section on hypothesis testing.

The hypotheses were tested performing regression-based path analysis with the use of two SPSS-based macros provided by Preacher and Hayes (2004, 2007). Results showed support for Hypothesis 1, which states that project management complexity will positively influence team effectiveness. Hypothesis 2 was supported, showing that shared leadership partially mediates the relationship between project management complexity and project team effectiveness. Hypothesis 3 was also supported, showing

that political skill moderates the relationship between project management complexity and team effectiveness via shared leadership.

Chapter 5 – Discussion, Conclusions, and Implications for Theory, Practice, and Future Research

Introduction

This chapter begins with a brief summary of this study. It then considers the findings from the data analysis in Chapter 4, and relates these findings to existing literature. Conclusions and implications for theory are presented, followed by implications for practice in the areas of project management complexity, shared leadership, political skill, and team effectiveness. Recommendations for future research are discussed. The chapter concludes with a summary.

Summary of the Study

The purpose of this study was to examine the influence of shared leadership and political skill on the relationship between project management complexity and project team effectiveness in organizations. Within the theoretical grounding of the IMOI (Ilgen et al., 2005) team effectiveness framework, the study examined the direct effect of project management complexity on the outcome, team effectiveness. The study also examined the mediating effects of shared leadership on the relationship between project management complexity and team effectiveness. The moderating effects of team political skill on the relationship between project management complexity and team effectiveness via shared leadership was also examined. The conceptual model for the study is presented in Chapter 1 (p. 8). The following research questions and hypotheses guided the study:

Research Question 1: What is the impact of project management complexity on project team effectiveness?

H1: Project management complexity will positively influence project team effectiveness.

Research Question 2: Can shared leadership explain the relationship between project management complexity and project team effectiveness?

H2: Team shared leadership plays a mediating role on the relationship between project management complexity and project team effectiveness.

Research Question 3: How does team political skill influence the relationships between project management complexity, shared leadership, and team effectiveness?

H3: Team political skill will moderate the strength of the mediated relationship between project management complexity and team effectiveness via team shared leadership such that the mediated relationship will be stronger under high team political skill than under low team political skill.

Based upon the research questions and hypotheses, the design of the study employed a quantitative cross sectional survey design and multilevel modeling techniques for the purpose of contributing to the empirical knowledge in the study of teams and increasing the generalizability of the findings. To expand prior research, the study targeted six related industries including consumer packaged goods (CPG), logistics, manufacturing, retail, retail consulting, and wholesale. These industries were chosen for this study due to the importance of project teams in the complex environments of

companies involved in the management of supply chains (Paulraj et al., 2012; Stank et al., 2011).

A survey instrument was constructed from previously validated measures of project management complexity, team effectiveness, shared leadership, and political skill. The survey instrument was used to collect self-report data from individual project team members and project managers on their perceptions of the key variables of the study. Company, team, and individual level demographic data were also collected. Prior to data collection for the main study, a pilot study was conducted in one retail organization. Results of the pilot study indicated that the survey instrument was reliable and there was no need to remove or alter items. In the current main study, a total of 209 responses from project team members and project managers (response rate 67.9%) were collected from 30 teams in 17 global and U.S. organizations.

Preliminary analysis was performed prior to hypotheses testing. Underlying assumptions about regression and correlational analysis, including linearity, normality, homoscedasticity, and multicollinearity, were examined. Results of these tests indicated no violation of linearity, data was normally distributed, homogeneity of variances was supported, and that little evidence of multicollinearity existed. Procedures to assess construct reliability were performed. The Cronbach's alpha coefficients for the scales ranged from .806 to .948, indicating reliability of the measurement instrument. Due to the multilevel nature of the data, interrater agreement and reliability tests were conducted and aggregation of individual responses to the team level was justified. To assess discriminant and convergent validity, confirmatory factor analysis (CFA) was performed on three alternative models, with results indicating superiority of the hypothesized four-

factor measurement model. Convergent validity was verified by examining factor loadings, average variance extracted (AVE), and composite reliabilities (CR). All study factors generally demonstrated convergent validity.

SPSS macros, provided by Preacher et al. (2004, 2007), were utilized in all hypotheses testing to perform regression-based analyses and to generate bootstrap confidence intervals for the regression coefficients. Regression tests were performed controlling for industry, team size, ethnicity, age, years with the company, and months on the project. Results showed that project management complexity positively influenced team effectiveness. Moreover, shared leadership explained the positive influence between project management complexity and team effectiveness, as test results indicated that shared leadership played a mediating role in this relationship. Results also demonstrated that political skill of the team moderated the strength of the mediating role of shared leadership such that mediation was higher when team political skill was high.

Discussion of the Findings with the Relevant Literature

This section discusses the results of the hypotheses testing and relates these findings to the relevant literature. Findings are then used to interpret the conclusions of the study. Each of the three study hypotheses are discussed in an integrated fashion as each key variable is introduced. The discussion is guided by theory and literature relevant to the key study variables. Table 11 in Appendix L summarizes comparisons between existing research and the findings of this study.

Hypothesis 1

The first hypothesis stated that project management complexity positively influences team effectiveness. Regression analysis was performed, controlling for

industry, team size, ethnicity, age, length of time with the company, and length of time in the project team. Results of the regression analysis showed that project management complexity was significant in predicting team effectiveness in support of Hypothesis 1.

Complexity issues are important for the management of projects in organizations and given the limited research on the topic, the urgency for better understanding complexity is necessary (Aitken & Crawford, 2007; Saynisch, 2010; Winter et al., 2006). One of the most critical issues requiring attention in project management research is how to define and assess project management complexity (Cicmil et al., 2009). Project management complexity is a common attribute used to categorize projects, although organizations may describe this attribute using multiple criteria and characteristics (Aitken & Crawford, 2007). According to Aitken and Crawford (2007), the multiple characteristics of project management complexity in organizations might raise the question, "how do we assess it?" (p. 3). The current study supports and extends prior research by successfully assessing project management complexity; i.e., measuring and quantifying project management complexity within the context of multiple active projects in organizations in multiple industries. As such, this study responds to Baccarini's (1996) call for research that should operationalize the concept of project management complexity; i.e., research should allow project management complexity to be measured quantitatively and empirically. It is important for organizations to operationalize project management complexity in research to help guide organizations in assigning proper resources to projects, to develop competencies in resources assigned to projects, and to align projects with organizational strategy (Aitken & Crawford, 2007).

The current study extends previous literature considerably by demonstrating that project management complexity is significant in predicting team effectiveness in the participating organizations of this study. These results align well with previous studies which demonstrate that project management complexity is one of the key challenges of teams and their ability to deliver successful outcomes (Edmondson & Nembhard, 2009). The study is also unique in having assessed project management complexity within the IMOI model of team effectiveness (Ilgen et al., 2005). Previous models of team effectiveness present a more linear progression of inputs, processes, and outputs (Ilgen et al., 2005). According to Ilgen et al. (2005), the IMOI model "reflects the broader range of variables that are important mediational influences with explanatory power for explaining variability in team performance and viability" (p. 520). In this study, project management complexity was considered an environmental complexity factor that impacted team member interactions and positively influenced team effectiveness. The study also focused on the complex business environment aspects of project management with its use of the CIFTER scale (Aitken & Crawford, 2007).

This study also extends the team effectiveness literature with the measurement of team effectiveness in a standard and consistent fashion across seventeen organizations, without utilization of context-specific factors. Although "performance is the most widely studied criterion variable in the organizational behavior and human resource management literatures" (Bommer, Johnson, Rich, Podsakoff, & MacKenzie, 1995, p. 587), much of the research on teams concentrates on the antecedents and influences on team effectiveness, rather than on the team effectiveness outcome (Mathieu et al.,2008). This is primarily due to organizational idiosyncrasies and lack of consistent measurement of

team effectiveness (Mathieu et al., 2008). Many empirical studies in the literature utilize context and organization specific criteria to measure the outcome variable, team effectiveness rather than standard factors of goal achievement, quality and quantity of output, and performance behaviors. The current study utilized a team effectiveness scale that measures output, quality, change, organizing and planning, interpersonal, value, and overall effectiveness factors (Pearce & Sims, 2002).

Hypothesis 2

The second hypothesis tested a simple mediation model and stated that shared leadership in project teams plays a mediating role on the relationship between project management complexity and project team effectiveness. Mediation analysis using multiple regression was performed, controlling for industry, team size, ethnicity, age, team member length of time with the company, and team member length of time in the project team. As the first step in the mediation model, test results from Hypothesis 1 showed that project management complexity was significant in predicting team effectiveness. Satisfying the second and third steps in the mediation model, a significant, indirect effect was found in the relationship between project management complexity and shared leadership and in the relationship between shared leadership and team effectiveness. In the final step of the mediation model, results showed a significant total effect in the relationship between project management complexity and team effectiveness through shared leadership, therefore supporting Hypothesis 2 in that shared leadership partially mediates the relationship between project management complexity and team effectiveness.

Little empirical research has investigated shared leadership specifically as a mediator, although other conceptual studies have recommended that future research should examine shared leadership as a mediator in the relationship between key variables, such as vertical leadership and outcomes. Wang et al. (2014) suggested that "future research might also address the interplay of vertical and shared leadership" and "shared leadership may partially mediate the relationship between vertical leadership and outcomes" (p. 192). Balthazard, Waldman, and Warren (2009) discuss the potential for shared leadership to emerge in virtual teams, as "virtual teams oftentimes have no designated leader, instead relying on a shared leadership model" (p. 651).

The results of the current study extend current research by showing that the mediating effects of shared leadership is especially important in explaining the effectiveness of teams in a variety of complex project contexts. Two current meta-analyses specifically address the complexity-shared leadership-team effectiveness relationship in the literature. Results of both meta-analyses showed that when the task work of teams is more complex, the relationship between shared leadership and team effectiveness is stronger and the benefits of shared leadership become more apparent (D'Innocenzo, Mathieu, & Kukenberger, 2014; Wang et al., 2014). In contrast to this previous research, the current study contributes uniquely to the literature as it empirically explored shared leadership as a mediator in the relationship between project management complexity and team effectiveness.

Hypothesis 3

The third hypothesis stated that team political skill will moderate the strength of the mediated relationship between project management complexity and team

effectiveness via shared leadership such that the mediated relationship will be stronger under high team political skill than under low team political skill. This hypothesis builds upon Hypotheses 1 and 2 in that it introduced political skill as a conditional variable of the mediation relations. Test results indicated that the mediating effect of shared leadership on the positive relationship between project complexity and team effectiveness is lower at low levels of political skill, and higher at high levels of political skill.

In the current dynamic and competitive global environment, project teams are challenged to operate under ambiguous and uncertain conditions. According to Edmondson and Nembhard (2009), ambiguity and uncertainty "are precisely the conditions under which teams are deemed most necessary" (p. 127). As previously stated in the literature review, political skill is recognized as one of the most important leader competencies contributing to organizational effectiveness (Ahearn et al., 2004; Ferris et al., 2005; Harris et al., 2007; Treadway et al., 2004).). Because the work of project teams is critical to organizational effectiveness, it follows that political skill is also important to team effectiveness (Ahearn et al., 2004, Douglas & Ammeter, 2004). Very few studies have assessed political skill as a shared team property to predict team effectiveness. In one such study of twenty-eight teams in a Russian branch of one multinational corporation, Lvina (2011) found a positive relationship between team political skill and team effectiveness. The current study replicates and also extends these results by adapting the political skill inventory (PSI) scale for use at the team level and examining data across a broader sample population of thirty teams in seventeen organizations.

Ahearn et al. (2004) found that political skill of the team leader had a direct and positive influence on team performance and had a stronger impact on team effectiveness than team empowerment, a component of shared leadership. In contrast to Ahearn et al.'s (2004) study, the current study suggests that political skill of the team as a whole influences the strength of shared leadership on the team effectiveness outcome. These contrasting results suggest that political skill of the team leader and of the team as a whole may have differing influence on team effectiveness, depending upon the context of the study.

Conclusions and Implications for Theory

It is clear that organizations are facing change and complexity at accelerated rates, that organizations are increasing the use of project teams to perform the work of organizations, and that new forms of leadership and skills are needed for team effectiveness (Anderson, 2012; Birkinshaw & Heywood, 2012; Burnes, 2004, 2005; Karakas, 2009; Parsons, 2009). This section describes three major implications for theory. First, the study extends the empirical knowledge of the IMOI (Ilgen et al., 2005) model of team effectiveness by including project management complexity, shared leadership, and political skill as important variables in the relationship with team effectiveness. Secondly, the study extends the empirical literature base of the relationship between project management complexity and political skill in the workplace by measuring these constructs at the team level. Thirdly, the conceptual model in this study broadens the future research potential of project management to include other business disciplines.

IMOI Model of Team Effectiveness

Early depictions of project management models are based upon the inputs, processes, and outputs (IPO) model (Andersen, 2010). The early IPO model was considered "the most popular way of framing relationships among variables associated with team effectiveness" (LePine, Piccolo, Jackson, Mathieu, & Saul, 2008, p. 278). The IMOI model of team effectiveness, reflecting the modern complexity and cyclical nature of teamwork, provided the theoretical framework for the key variable relationships in this study (Ilgen et al., 2005). Project management complexity, shared leadership, and political skill were operationalized as antecedent variables and emergent states that influenced team effectiveness in the IMOI model (Ilgen et al., 2005).

Project management complexity. Although projects are increasingly being used to perform the complex work of organizations, "the conceptual base of models and methodologies for project management has remained fairly static in the past" (Svejvig & Andersen, 2014). Winter et al., (2006), identified five directions needed in project management research: project conceptualization, project complexity, practitioner development, social process, and value creation. Cicmil and Marshall (2005) also identified multiple factors and characteristics of projects in a complex context. In the current study, the IMOI model of team effectiveness provided the theoretical framework to assess project management complexity in the relationship with team effectiveness. Team level inputs in the IMOI model include team level factors, team member characteristics, environmental complexity, and organizational design features (Mathieu et al., 2008). This study extends the IMOI model of team effectiveness by operationalizing project management complexity, identified as an important direction in future research

for project management, as a team level input in the IMOI model of team effectiveness. The results of the study show evidence of the influence of project management complexity on the outcome variable, team effectiveness,

Shared Leadership. According to Mathieu et al. (2008), mediating processes have recently been given more attention by researchers to explain why specific inputs influence team effectiveness. In the IMOI model, mediating influences are either processes or emergent states (Mathieu et al., 2008). Processes in the IMOI model include transitional, actionable, and interpersonal processes, while examples of emergent states include team empowerment, team climate, trust, and team confidence (Mathieu et al., 2008). These emergent states are characteristics of shared leadership in teams (Pearce & Sims, 2002). In addition, shared leadership in project teams is likely to be more effective when the project environment is dynamic and turbulent, project tasks are interdependent, a high level of creativity exists, and the project is characterized by complexity (Clarke, 2012b). The study hypotheses support and extend the IMOI model of team effectiveness (Ilgen et al., 2005) by identifying shared leadership as a mediator in the conceptual model. The results provide evidence of the existence of shared leadership as a mediating influence in the relationship between project management complexity and team effectiveness.

Political Skill. In the development of the IMOI model of team effectiveness, Ilgen et al., (2005) state "knowledge, attitudes, and behaviors are both inputs and processes in a developmental sequence that impacts team performance" (p. 519). In the current study, political skill is a team input in the context of the IMOI model, referring to how team members interact with each other through being aware of diverse social

situations, exerting influence on others around them, using diverse networks of colleagues, and possessing high levels of authenticity and sincerity (Ferris, et al., 2005).

Clarke (2012b) expands upon the importance of connecting political skill at the team level to shared leadership and project management complexity, and the potential impact of these constructs on team effectiveness, positing that shared leadership will be more effective in project teams displaying greater political behavior. Findings from the current study provide empirical evidence that the dimensions of political skill (social astuteness, interpersonal influence, networking ability, and apparent sincerity) moderate the strength of the partially mediated relationship between project management complexity and team effectiveness via shared leadership. The indirect effect of shared leadership on the relationship between project management complexity and team effectiveness was stronger when team political skill was higher.

Measurement of Project Management Complexity and Political Skill as Shared Team Properties

The current study operationalized the CIFTER scale by requiring all team members to assess project management complexity as a shared team property; i.e., data was collected from individual team members, within-group agreement was assessed, and individual responses were aggregated to the team level to represent a shared team property. The current study utilized the CIFTER (Crawford-Ishikura Factor Table for Evaluating Roles) to assess the level of project management complexity in a sample of 30 teams in multiple industries (Aitken & Crawford, 2007). This seven-factor scale was originally developed as a self-assessment tool used by project managers to categorize projects according to project management complexity (Aitken & Crawford, 2007). In

contrast to the current study, previous studies have utilized the CIFTER to collect observations relevant to project management complexity at an individual level; i.e., the CIFTER assessed perceptions of project management complexity based upon the perceptions of individual project managers or stakeholders (Aitken & Crawford, 2007). Therefore, use of the CIFTER scale in this study to measure project management complexity as a shared team property is a significant implication in how project management complexity may be measured in future empirical studies and how it may be conceptualized in theoretical and conceptual models of teams.

Additionally, this study contributes to the empirical research of teams by assessing political skill at the team level. The current study assessed political skill with the previously validated Political Skill Inventory (PSI) scale (Ferris et al., 2005). The PSI was originally developed to assess the extent to which individuals display the characteristics of social astuteness, interpersonal influence, networking ability, and apparent sincerity (Ferris et al., 2005). However, for this study all items from the 18-item scale were adapted for responses at the team level. For example, a sample item is "My team members spend a lot of time and effort at work networking with others." Adapting the PSI scale for responses at the team level allowed a multilevel conceptualization of political skill of the team; i.e., perceptions of the presence of political skill in the team were measured at the individual level, allowing assessment of political skill as a shared team property (Klein & Kozlowski, 2000). According to Vigoda-Gadot and Vashdi (2012), "if team politics is a team-level phenomenon, then the consequences of such team political behavior must be examined at the team level" (p. 314). The current study shows that political skill, as a team-level phenomenon,

influences the outcome team effectiveness. Therefore, use of the PSI scale in this study to measure political skill as a shared team property is a significant implication in how political skill may be measured in empirical studies and how it may be conceptualized at the team level in theoretical and conceptual models of teams.

Multidisciplinary Nature of Project Management Research

The study has implications for research in project teams by synthesizing concepts from the fields of project management, social psychology, and HRD in a cross-disciplinary fashion, and therefore highlighting the multidisciplinary nature of project management research. Although project teams are very important for organizational success, very limited research exists linking business domains to project management (Carden & Egan, 2008). Research and literature in the field of project management has "focused almost exclusively on traditional project management contexts" (p. 311). These contexts include information technology, engineering, manufacturing, and construction (Carden & Egan, 2007). In addition, research in the field of project management focuses on tangible project outcomes, such as adherence to cost and schedule estimates, to determine the success of the project (Kerzner, 2004). The conceptual model in this study links the concepts of shared leadership, political skill, and team effectiveness to project management complexity, broadening the scope of research potential in the project management discipline.

Implications for Practice

This section describes implications of the findings of this study for business and industry, for the field of HRD, and for the preparation of university students in the areas of leadership and project management.

Implications for Business and Industry

Project Management Complexity and Organizational Success. Globally, organizations are formulating new approaches to stay competitive and successful, are restructuring the complex work of the organization around teams, and are implementing projects and project teams as the primary method to execute the complex work required for success (Daspit et al., 2013; Haas, 2006; Hoch & Dulebohn, 2013; Kozlowski & Ilgen, 2006; Levi, 2011; Pearce, Manz, & Sims, 2009). Understanding the issues relevant to project management complexity and how to manage complex projects is critical to effectiveness in teams, and therefore to organizational success (Cicmil et al., 2009; Remington et al., 2009; Singh & Singh, 2002).

For purposes of the current study, project management complexity refers to how difficult projects are to manage. The results of the current study show that project management complexity is significant in predicting team effectiveness, indicating that the management of project complexity has a direct influence on team effectiveness in projects. Formal assessment of the level of project management complexity at the inception of projects would assist team members and project managers in understanding stakeholder cohesion, goal definition, and social and legal implications associated with projects. Understanding the components of project management complexity would therefore increase the effectiveness of the team by guiding them in taking the appropriate measures for the mitigation of risks (Kerzner, 2004). Along with understanding the level of project management complexity in projects, project management principles can be introduced and encouraged in project team members and managers prior to the formation of the project (Aitken & Crawford, 2007; Kerzner, 2004; PMI, 2013).

Project Team Success and Shared Leadership. Project teams are likely to be effective when displaying high levels of team communication, collaboration, and cohesiveness, all characteristics associated with shared leadership in teams (Clarke, 2012b; Yang et al., 2011). Results of the current study show that shared leadership partially mediates the relationship between project management complexity and team effectiveness; i.e., shared leadership is significant in partially explaining the positive relationship between project management complexity and team effectiveness. This result is important to organizations interested in increasing the effectiveness and success of teams in complex project contexts.

Project team success is directly related to team effectiveness factors; i.e., a project is successful when it is completed on time and within budget, and has acceptably achieved its goals with quality outcomes (Lavagnon, 2009; Pinto & Slevin, 1988). Because the presence of shared leadership in teams may partially explain how project management complexity positively influences team effectiveness, organizations may consider implementing shared leadership principles during formation of project teams. Participative goal setting, empowerment of team members to achieve goals, and encouragement of independent action, all hallmarks of shared leadership principles, can be implemented by project teams to increase team effectiveness (Carson et al., 2007; Hoch et al., 2010; Pearce & Sims, 2002).

Shared Leadership in Organizations. In the current study, shared leadership was shown to partially mediate the relationship between project management complexity and team effectiveness; i.e., shared leadership played a very important and significant role in explaining why project management complexity predicted team effectiveness.

Research in the area of project team leadership has traditionally focused on the role of the project manager rather than the influence provided by other team members (Carson et al., 2007; Clarke, 2012b; Hoch & Dulebohn, 2013). The definition of shared leadership proposed by Carson et al. (2007) states that shared leadership is "an emergent team property that results from the distribution of leadership influence across multiple team members" (p. 2007). Historically, organizations viewed leadership of projects as "firmly within the boundaries of the project manager" (Clarke, 2012b, p. 196). Results of the current study suggest that organizations may wish to rethink this traditional view. When shared leadership is present, or emerges, in a complex project context, project managers may become team members, sharing the lead, and therefore reframing the role of the project manager and contributing to evolving leadership structures in teams (Maylor, Vidgen, & Carver, 2008). Team training for the purpose of instilling principles of shared leadership in project teams may guide organizations to make progress in reframing the roles of the project team members and project managers.

Project Team Political Skill. Organizations should consider understanding the benefits of political skill at the team level and how they contribute to project team effectiveness. Political skill in teams was shown to influence the strength of the effect of shared leadership such that when political skill was high, the mediating effect of shared leadership in the relationship between project management complexity and team effectiveness was high. In addition, the study analysis showed that the significant and positive correlation between political skill and shared leadership was stronger than all other main study variable relationships. Interpersonal influence, social astuteness, networking ability, and apparent sincerity are dimensions of political skill that determine

the level of influence on the team as a whole or on stakeholders outside of the team (Ilgen et al., 2005). Organizations would improve team effectiveness by selecting team members who demonstrate these attributes.

Implications for the Field of Human Resource Development

Findings of this study contribute to the field of HRD in two important ways. From a practice perspective, HRD may facilitate the increased effectiveness of teams by fostering shared leadership as a new type of leadership philosophy in the organization and engaging team members to operationalize shared leadership in project teams. Secondly, HRD practitioners may implement awareness and training of the benefits of team political skill within a complex project setting.

Operationalization of Shared Leadership in Teams. Although shared leadership is a fairly new concept in business and industry, there is growing acceptance of this type of leadership structure in organizations (Carson et al., 2007; Manz, Pearce, & Sims, 2009). According to Pearce, Manz, and Sims (2014), shared leadership is a new perspective on leadership in that "nearly every single human being is capable of sharing the burden and responsibility of leading" (p. xiii). HRD practitioners should provide increased organization-wide awareness and education on the principles of shared leadership and how this type of leadership structure benefits both organization and team outcomes. HRD practitioners can work with project teams during formation to instruct team members on how to engage and foster shared leadership within the team.

Training on the Benefits of Political Skill in Teams. It is important for HRD professionals in organizations to be aware of team-level political skill and of its potential benefits to team outcomes. This awareness may have practical implications during the

formation of the team, and particularly during the selection of team members and the design of leadership in the team. Politically skilled individuals are socially astute and as such have the ability to dynamically respond to the demands of teamwork (Ilgen et al., 2005). During the onboarding stage of the team, HRD practitioners can provide guidance to team members on the potential benefits of team political skill. They can also provide ongoing guidance in the form of developmental experiences and mentoring during the entire project life cycle. In addition, HRD practitioners in organizations can work with team sponsors, project managers, and team members to educate them on the merits of the positive use of political skill and its influence on team effectiveness.

Implications for Skill Preparation in University Settings

Business and industry contexts are in need of employees either who either possess effective team skills or can be trained by human resource development professionals in enhancing such skills. Therefore, institutions of higher education are now being held accountable by future employers of college graduates to prepare students to meet the needs of the workforce of the future (Holtzman & Kraft, 2011). As a consequence, the faculty of universities, and in particular colleges of business, must continually "develop, monitor, evaluate, and revise the substance and delivery of curricula and assess the impact of curricula on learners" (Holtzman & Kraft, 2011, p. 62). The major contribution of this study to university teaching is the importance of emphasizing and integrating the concepts of teamwork and project management skills into the curriculum of university students. Secondly, the study introduces the importance of recognizing the viability of shared leadership as a new form of leadership in the workforce of the future. Finally, the study shows that political skill is important as an influencing factor on team

effectiveness, and therefore an important skill for university students to learn and bring to the workplace.

Teamwork Skills. A recent study commissioned by the Association of American Colleges and Universities resulted in the report, *College Learning for the New Global Century* (Association of American Colleges and Universities, 2008). The purpose of the report was to articulate the "essential aims, learning outcomes, and guiding principles for a twenty-first-century college education" (Association of American Colleges and Universities, 2008, p. vii). As part of the study, 305 employers were surveyed for the purpose of understanding the skills most important to employers. Seventy-six percent of the surveyed employers indicated that teamwork skills are important for a business college graduate to possess; new concepts in technology, at 82%, was the only skill scoring higher.

Results of the current study emphasize that certain skills in team members are very relevant to the success of teams. Understanding the principles of complexity in projects and mitigating the risks is very important to team success and effectiveness. In addition, as the work of teams becomes more complex, team members may become more involved in sharing the leadership of the team with unique expertise not provided by other team members. Lastly, results of the study show that political skill in teams has a direct influence on the level of shared leadership in the team, and ultimately on team effectiveness. Therefore, the results of this study are very relevant to the needs of organizations and to the skill preparation provided by universities.

Project Management Skills. It is important to integrate project management skills into the curricula of undergraduate and graduate students. According to Heller

(2011), every student should be exposed to certain real-world tools and concepts from the project management discipline. A short list of these tools includes Gantt charts, critical path techniques, preparation of requests for proposals, and action plans (PMI, 2013). Students should be exposed to these tools, regardless of their major concentration. According to Deshpande (2012), "in industries as diverse as pharmaceuticals, software and aerospace, projects drive business" (p. 386).

Shared Leadership Skills and the New Generation of Leaders. Shared leadership is increasingly prevalent in global companies (Manz et al., 2009). Previous studies have shown that characteristics of the current generation of students (immersed in technology, empowered, eager to undertake projects, participative in groups and teams, and self-organizing) are similar to the characteristics of teams with shared leadership (Albion & Gutke, 2010; Balda & Mora, 2011; Pearce et al., 2009). The results of the current study demonstrate that shared leadership has a significant and positive effect on team effectiveness, emphasizing that with the rise in shared leadership in organizations, it is vital that universities recognize shared leadership as a developmental tool for the current and future generations of students.

Political Skills. In a study of students in a university setting, Treadway et al. (2005) found that individual motivation and willingness to use influence was a strong factor in engaging in political behavior. Treadway et al. (2005) suggested two implications for managers in organizations: the usefulness of implementing training programs to enhance political skill of employees, and the idea that political skill can be developed, or learned, by employees. In a later study of 168 university students, Geyer (2014) observed a significant relationship between general self-efficacy and political

skill. According to Geyer (2014), "the college setting is ripe with opportunities to hone this important skill set prior to entering the workforce" (p. 13). Development of political skill in the university setting may allow students to become more competitive in the classroom, as well as in their careers.

Limitations of the Study

The current study has potential limitations. Six specific but related industries were represented in the study, and generalization of the results may be applied only to teams in these industries. In addition, the key variables were measured with the use of self-report surveys. Data was collected from team members for all variables, and therefore common method bias may be a potential issue (Podsakoff et al., 2003). Mitigation measures were implemented to lower the likelihood of biased findings.

Recommendations for Future Research

The purpose of this study was to examine the influence of shared leadership and political skill on the relationship between project management complexity and project team effectiveness in organizations. The following are several directions for future research, based upon the findings and limitations associated with the study and the literature reviewed in Chapter 2.

According to Ilgen et al. (2005), there is an increasing interest in research on input factors and mediators that may influence the outcome of team effectiveness. Results of the current study show empirical evidence that shared leadership has a mediating influence on the relationship between project management complexity and team effectiveness. The conceptual model for the current study is based upon the IMOI model of team effectiveness (Ilgen et al., 2005). Mediators in the IMOI model are considered

team processes or emergent states. Team processes include transitional, action, or interpersonal factors, while emergent states may include factors such as team confidence, efficacy, empowerment, and climate. Team inputs in the IMOI model are antecedents that include team member characteristics, team-level factors, and organizational-level factors (Ilgen et al., 2005). Future research can benefit from integrating shared leadership with other antecedent and mediating factors, therefore expanding the conceptual framework presented in the current study. As limited or no conceptual frameworks have been developed integrating antecedents, team processes, mediating factors, and moderators involved in the project management complexity and team effectiveness relationship, these factors will further distinguish the influence of shared leadership in the framework as presented in the conceptual model.

According to Clarke (2012b), "research on leadership in projects has been dominated by the search for optimum leadership profiles for project managers involved in different types of projects" and that "leadership in effect is treated as synonymous with project manager influence" (p. 196). This view of all leadership in projects as being strictly the responsibility of the project manager is being questioned (Carson et al., 2007; Clarke, 2012a). The current study provides empirical evidence that shared leadership, as an alternative form of leadership in project teams, has a direct and positive influence on team effectiveness. Future research might include studies that examine and compare project managers and team members on differences in their perceptions of shared leadership in the team. Questions for this type of research may include: Do project managers and team members differ in whether they recognize shared leadership as an effective form of leadership? Does the project manager contribute to and influence the

emergence of shared leadership in the team? Is the existence of shared leadership directly related to the project manager, or rather to the project team members?

Examination of team-member exchange quality (TMX) within project teams might offer additional insight to the effectiveness of shared leadership in project teams. Clarke (2012b) posits that communication between project team members may influence whether shared leadership is effective in project teams. According to Seers (1989), "the quality of the team-member exchange relationship indicates the effectiveness of the member's working relationship to the peer group." (p. 119). The team-member exchange quality (TMX) scale assesses whether members of the team help, encourage, and support each other in the work of the team (Bakar & Sheer, 2013). Future research might examine whether the high quality of team-member exchange contributes to factors that are components of shared leadership, such as team and individual empowerment, team vision, and encouragement to find solutions to team problems. In addition, future research linking team-member exchange (TMX) and shared leadership may give further insight on other potential antecedents of shared leadership.

This study shows that political skill is fundamental in contributing to leadership effectiveness in teams. Again drawing upon the IMOI model (Ilgen et al., 2005), empirical results indicate that political skill, as a team input, moderates the strength of the mediated relationship between project management complexity and team effectiveness via shared leadership. Future research should continue to utilize the political skill inventory scale adapted to the team level in diverse team and organizational settings, as well as different sample populations. For example, it would be of interest to understand the relationship between the political skill of the project manager and the political skill of

the team members and how these contribute to leadership effectiveness in teams. According to Clarke (2012b), previous studies have shown that shared power may reduce negative political behavior and control tactics. Questions for this type of research may include: What is the impact of highly political project managers on the team as a whole? Is there a difference between perceptions of the team members and the project manager about the political skill of the team as a whole? Do the project managers rate the team high in political skill, but the team members rate the team low in political skill? Additional fruitful avenues for research may include examination of the level of political skill in the team in relation to certain team member demographics, such as team member tenure with the company. An example of this type of question might include: Does longevity in tenure with the company influence the level of political skill in the team? Other team settings, such as top management teams, ongoing teams, and innovative product teams should be examined. Thus, results of this study can serve as a catalyst for future testing of the relationships in theoretical models of teams with political skill as an antecedent or influencing variable.

Findings from this study, based on project teams in six industries related to the supply chain, show a weak negative correlation between industry and team effectiveness. Furthermore, industry as a control variable did not show significant influencing effects in the mediation or the moderated mediation models. These results are contrary to previous empirical results showing that the positive effects of shared leadership on team effectiveness may be significantly influenced by differences in industry (Daspit et al., 2013; Yang et al., 2011). Although limited research exists specifically examining political skill in teams, empirical results from Reynold's (1986) previous pilot study

showed a significant difference in informal and political processes in organizations in three different industries: computer services, franchised restaurants, and advanced industrial technology. A further avenue for research would include expanding the sample in the current study to include industries outside of the supply chain in which the success of project teams in complex environments is critical to success of the organization. Examples of other industries outside those in the supply chain that have embraced shared leadership due to its positive influence on team effectiveness are prevalent in the literature, particularly the education, medical, and technology industries (Pearce & Conger, 2003; Pearce et al., 2014; Manz et al., 2009). Future research in other industries outside of the supply chain connecting shared leadership and political skill and their influence on the relationship between project management complexity and team effectiveness would highlight the importance of shared leadership and political skill in teams.

In addition to the previous recommendations for further studying project management complexity, team effectiveness, shared leadership, and political skill in a contextual context, alternative and supporting design considerations may provide avenues for future research. One recommendation for future research on shared team properties is to employ a longitudinal design, with data gathered at multiple points during the project cycle, and therefore lessening the potential for the responses to be biased by perceptions at the individual level. According to Gockel and Werth (2010), use of the self-report survey design in research on shared team properties requires that team members respond with perceptions of the team as a whole. This method is most reliable if the team members have worked on the team for some duration of time in order to observe team

member behavior (Gockel & Werth, 2010). Other models of analysis may be used in future studies regarding the key study variables. For example, social network methods could be used to provide additional insight on the perceptions of team members (Gockel & Werth, 2010). These methods are based upon social network analysis and diversity in teams. Shared team properties are measured by values of centralization, "a measure of the variability of individual indexes" (Gockel & Werth, 2010, p. 174). In the social network method, team members are asked to rate each other on influence factors and behaviors.

Although organizations continue to experience increasing complexity in the global competitive environment and are continuing to increase the use of project teams to manage complex work, there is limited empirical research regarding the assessment of project management complexity in projects. PMI continues to indicate the urgency for new research and theory in this area (Winter et al., 2009). Research undertaken by Aitken and Crawford (2007) provided the "first global study to test use of the CIFTER as a means of categorising projects according to their project management complexity" (p. 3). The current study reported a slightly lower Cronbach's alpha for scale reliability (α = .806) as well as lower ICC's (ICC(1) = .066; ICC(2) = .529) in comparison to the other scales utilized in the study. Examination of the AVE for convergent validity (39.13) for the project management complexity scale indicated a slightly lower than recommended value. These results may warrant the need for additional empirical validation of the CIFTER scale. Another avenue for future research is the development and validation of a new scale to more comprehensively measure project management complexity in projects.

Such a scale might also include the assessment of additional types of complexity in projects, such as technical or process complexity.

In conclusion, as the work of project teams in organizations increases in complexity due to global and environmental factors, demands on project team members increase with additional time pressures, awareness of the importance of the project's outcome to the organization, and increased visibility of team performance (Edmondson & Nembhard, 2009). Instability of the overall project context, financial impact, and stakeholder cohesion are a few of the factors that define the level of project management complexity in a project (Aitken & Crawford, 2007). These factors may impose increased demands on the project, and therefore lead to stress for the project team and team members (Edmondson & Nembhard, 2009). Stress may result in reduced team cohesion or coordination as well as negative physical or cognitive states (Dietz, Sierra, Smith-Jentsch, & Salas, 2012). A recommendation for future research is to examine project management complexity and its relationship to team member stress. Stress may be measured at the individual or team level (Dietz et al., 2012), and thus provide fruitful avenues for further investigation of project management complexity and its impact on project team members and organizations.

Chapter Summary

This chapter began with a summary of the study, including the purpose, the research questions and hypotheses, and how the data was collected and analyzed. The chapter continued with a discussion of the findings relative to existing literature. Overall conclusions of the study were stated, along with how the study extends and offers new insights to current literature along with implications for theory. Next, implications for

the business community, the HRD field, and higher education were discussed. Limitations of the study were briefly addressed. The chapter concluded with recommendations for future research.

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Appendices

Appendix A: Pilot Study Recruitment Email Script

June 28, 2013

From: (Name of Company Officer), Senior Vice President – Chief Information Officer

(Company Name) has undergone many changes over the past few years and continues to achieve its goals relating to the company strategic mission: To provide a great place to work and shop. As progress toward these goals continue, an area of particular interest to Cathy Cockrell, a (Company Name) employee and doctoral student at the University of Texas at Tyler, relates to the aspects of project team work that leads to and accomplishes strategic plans and how companies in general can improve upon project team effectiveness.

Cathy, together with other advisors and researchers at The University of Texas at Tyler, has created a web-based survey that is focused on better understanding complex projects, along with the team member leadership skills necessary for positive impact on project outcomes. I have given her approval to conduct this study and I am emailing you to make you aware of the web link that will allow you to complete the survey should you wish to participate. Cathy has had no involvement in the selection of participants for this survey.

You have been selected to participate in this research project because you have participated in (name of the project implementation) as a team member or leader during the previous year. Your taking part in this web survey is <u>completely voluntary</u> and you may complete it during work hours. Should you choose to participate, your survey responses will be anonymous and only seen by the research team at The University of

Texas of Tyler. The survey instrument does not collect any identifying information and we will make sure that the information we collect is kept private and used only for the study we are discussing.

Cathy may use the data to support her research interests through publication or conference venues, but no identifiable characteristics will be used, including the identification of (Company Name). Once the project is concluded, I will send a follow up email providing an executive summary of results to everyone invited to participate (regardless of actual participation).

If you have any questions or concerns, just let me know or direct your questions to Dr. Gloria Duke, Chair of the The University of Texas at Tyler Institutional Review Board at (903) 566-7023, or gduke@uttyler.edu. If you are interested in participating in this study, please click on the following link by July 18, 2013:

https://www.surveymonkey.com

Thank you,

(Name of Company Officer)

Appendix B: Pilot Study Online Survey

PILOT STUDY PROJECT TEAM SURVEY

WELCOME!

INFORMED CONSENT

The purpose of this research project is to better understand shared team leadership and team political skills in project teams, and their influence on team effectiveness.

This is a research project being conducted by a research team at the University of Texas at Tyler, in conjunction with a PhD dissertation in Human Resource Development. You have been selected to participate in this research project because you have participated in a (company name) implementation as a team member or leader of one of the following projects during the previous nine months:

- Name of Project 1
- Name of Project 2
- More projects....

Your participation in this research study is completely voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time by clicking the EXIT button in the top right hand corner or by simply closing your browser. If you decide not to participate in this study or if you withdraw from participating at any time, there will be no consequences.

The procedure involves completing an online survey that will take about 15-20 minutes. After you thoughtfully read each question or statement, click the button that corresponds to your response. You may need to scroll down the page to answer all the questions. Click NEXT to continue after each page, and then click DONE when finished. At any time prior to clicking DONE, you can click PREV to go back to a previous page, or EXIT to withdraw.

Your responses will be anonymous and no identifying information such as your name, department, email address, employee number, or any identifying computer software or hardware number, will be collected. No side effects or risks associated with your participation in this study are anticipated.

To protect your confidentiality, the surveys will not contain information that will personally identify you. All data is stored in a password protected electronic format. The results of this study will be used for scholarly purposes and may be shared with The University of Texas at Tyler representatives. Only a summary of the data will be shared through publication or conference venues. A summary of the data may also be shared with interested employees of (name of company) to assist the organization in understanding some of the factors that may lead to successful team performance.

This research has been reviewed and approved according to the University of Texas at Tyler Institutional Review Board (IRB) policies and procedures for research involving human subjects.

If you have any questions about the research study, please contact (names and email addresses of research team involved and also the company leader who sends this email to team members).

Page 1

PILOT STUDY PROJECT TEAM SURVEY

1. ELECTRONIC CONSENT: Please select your choice below.

Clicking on the "Agree" button below indicates that:

- **you have read the above information**
- **you voluntarily agree to participate**
- **you are at least 18 years of age**

If you do not wish to participate in the research study, please decline participation by clicking on the "Disagree" button.

◯ Agree

◯ Disagree

Page 2

PILOT STUDY PROJECT TEAM SURVEY

INDIVIDUAL DEMOGRAPHIC QUESTIONS

Please answer the following questions about yourself. (Remember that all information is completely confidential and none of the information is tied to your identity).

1. What is your own gender?

- ◯ Female
- ◯ Male

2. What is your own age?

- ◯ 18 to 24
- ◯ 25 to 34
- ◯ 35 to 44
- ◯ 45 to 54
- ◯ 55 to 64
- ◯ 65 or older

3. What is your own ethnicity?

- ◯ African American
- ◯ Alaskan Native
- ◯ Asian or P cific I lander
- ◯ Caucasian
- ◯ Hispanic
- ◯ Native American
- ◯ Other (please specify)

Other (please specify)

4. How many years have you worked for Brookshire Grocery Company? (please specify)

Years

Page 3

PILOT STUDY PROJECT TEAM SURVEY

5. What is the highest level of education you have completed?

- ◯ Did not graduate from high school
- ◯ Graduated from high school
- ◯ Attended college
- ◯ Graduated from college
- ◯ Attended graduate school
- ◯ Received a graduate degree

6. Choose the answer that best describes your role on your project team:

- ◯ Team member (functional or technical)
- ◯ Functional Leader
- ◯ Change Leader
- ◯ Project Leader

7. Choose the answer that best describes how long you participated as a team member or leader on the project.

- ◯ 0 – 3 months
- ◯ 3 – 6 months
- ◯ 6 – 9 months
- ◯ 9 – 12 months
- ◯ 12 months and over

8. Do you supervise or manage other Brookshire Grocery Company employees that are not members of the project team?

- ◯ Yes
- ◯ No

Appendix B (Continued)

PILOT STUDY PROJECT TEAM SURVEY

How complex is the management of this project?

IN ANSWERING THE PROJECT COMPLEXITY QUESTIONS, PLEASE EVALUATE WHAT YOU THINK ARE THE PERCEPTIONS AND BELIEFS OF THE TEAM RATHER THAN YOUR OWN PERSONAL BEHAVIORS OR BELIEFS!

Please choose a response to each of the following questions that best matches what the team perceives is the level of complexity in the management of the project.

Remember, be honest there are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

1. Stability of the overall project context. (Stability includes the project life-cycle, the stakeholders, the degree to which applicable methods and approaches are known, unproven concepts, uncertainty in the economic or political environment).

Very High	High	Moderate	Low or Very Low
◯	◯	◯	◯

2. Number of distinct disciplines, methods, or approaches involved in performing the project. (Project involves multiple functional disciplines; more disciplines mean a project that is more difficult to manage).

Very High	High	Moderate	Low or Very Low
◯	◯	◯	◯

3. Magnitude of legal, social, or environmental implications from performing the project. (Addresses the potential external impact of the project, or effect on individuals or organizations outside of the company; potential for catastrophic failure; larger number of stakeholders; more diverse stakeholder population).

Very High	High	Moderate	Low or Very Low
◯	◯	◯	◯

4. Overall expected financial impact (positive or negative) on project stakeholders.

Very High	High	Moderate	Low or Very Low
◯	◯	◯	◯

5. Strategic importance of the project to the organization or organizations involved.

Very High	High	Moderate	Low or Very Low
◯	◯	◯	◯

6. Stakeholder cohesion regarding the characteristics of the product of the project.

Very High	High	Moderate	Low or Very Low
◯	◯	◯	◯

Appendix B (Continued)

PILOT STUDY PROJECT TEAM SURVEY

7. Number and variety of interfaces between the project and other organizational entities.

Very High	High	Moderate	Low or Very Low
◯	◯	◯	◯

Page 6

PILOT STUDY PROJECT TEAM SURVEY

Questions regarding shared leadership in your team.

IN ANSWERING THE SHARED LEADERSHIP QUESTIONS, PLEASE EVALUATE WHAT YOU THINK ARE THE PERCEPTIONS AND BELIEFS OF THE TEAM RATHER THAN YOUR OWN PERSONAL BEHAVIORS OR BELIEFS!

Many teams have a formally appointed team leader, where leadership of the team comes solely from this individual. Shared leadership is the informal and mutual influence among team members as a another source of leadership for the project team. Please choose a response to each of the following questions that best matches what the team perceives is the level of shared leadership in the project team.

Remember, be honest there are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

AGAIN, PLEASE CHOOSE A RESPONSE THAT EVALUATES YOUR TEAM RATHER THAN YOUR OWN PERSONAL BEHAVIORS OR ATTITUDES!

There are 26 questions in this section. Please indicate the degree of your agreement with each statement.

*Please note that the possible responses to these questions are in a different order.

1. My team members provide a clear vision of whom and what our team is.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

2. My team members are driven by higher purposes or ideals.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

3. My team members show enthusiasm for my efforts.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

4. My team members encourage me to rethink ideas which had never been questioned before.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

5. My team members seek a broad range of perspectives when solving problems.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

6. My team members encourage me to go above and beyond what is normally expected of one (e.g., extra effort).

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

PILOT STUDY PROJECT TEAM SURVEY

7. My team members and I have clear agreements and stick to those when we work together.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

8. If I perform well, my team members will give positive feedback about me to my supervisor.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

9. My team members give me positive feedback when I perform well.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

10. My team members give me special recognition when my work performance is especially good.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

11. My team members decide on my performance goals together with me.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

12. My team members and I work together to decide what my performance goals should be.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

13. My team members and I sit down together and reach agreement on my performance goals.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

14. My team members work with me to develop my performance goals.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

15. My team members encourage me to search for solutions to my problems without supervision.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

PILOT STUDY PROJECT TEAM SURVEY

16. My team members urge me to assume responsibilities on my own.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

17. My team members encourage me to learn new things.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

18. My team members encourage me to give myself a pat on the back when I meet a new challenge.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

19. My team members encourage me to work together with other individuals who are part of the team.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

20. My team members advise me to coordinate my efforts with other individuals who are part of the team.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

21. My team members urge me to work as a team with other individuals who are part of the team.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

22. My team members expect that the collaboration with the other members in the team works well.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

23. My team members try to influence me though threat and intimidation.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

24. I feel intimidated by my team members' behavior.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

25. My team members can be quite intimidating.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

Appendix B (Continued)

PILOT STUDY PROJECT TEAM SURVEY

26. When my work is not up to par, my team members point it out to me.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

PILOT STUDY PROJECT TEAM SURVEY

Display of political skills by your team as a whole.

IN ANSWERING THE TEAM POLITICAL SKILLS QUESTIONS, PLEASE EVALUATE WHAT YOU THINK ARE THE PERCEPTIONS AND BELIEFS OF THE TEAM RATHER THAN YOUR OWN PERSONAL BEHAVIORS OR BELIEFS!

Political skill is defined as the ability to effectively understand others at work, and to use such knowledge to influence others to act in ways that enhance one's personal or team objectives. Please choose a response to each of the following questions that best matches what the team perceives is the level of political skills in the project team.

Remember, be honest there are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

AGAIN, PLEASE CHOOSE A RESPONSE THAT EVALUATES YOUR TEAM RATHER THAN YOUR OWN PERSONAL BEHAVIORS OR ATTITUDES!

AGAIN, PLEASE CHOOSE A RESPONSE THAT EVALUATES YOUR TEAM RATHER THAN YOUR OWN PERSONAL BEHAVIORS OR ATTITUDES!

There are 18 questions in this section. Please indicate the degree of your agreement with each statement.

*Please note that the possible responses to these questions are in a different order.

1. My team members spend a lot of time and effort at work networking with others.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

2. My team members are able to make most people feel comfortable and at ease around the team.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

3. My team members are able to communicate easily and effectively with others.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

4. It is easy for my team members to develop good rapport with most people.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

5. My team members understand people very well.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

6. My team members are good at building relationships with influential people at work.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

PILOT STUDY PROJECT TEAM SURVEY

7. My team members are particularly good at sensing the motivations and hidden agendas of others.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

8. When communicating with others, my team members try to be genuine in what they say and do.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

9. My team members have developed a large network of colleagues and associates at work whom they can call on for support when the team really needs to get things done.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

10. At work, my team members know a lot of important people and are well connected.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

11. My team members spend a lot of time at work developing connections with others.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

12. My team members are good at getting people to like them.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

13. It is important that people believe that my team members are sincere in what they say and do.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

14. My team members try to show a genuine interest in other people.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

15. My team members are good at using their connections and network to make things happen at work.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

Appendix B (Continued)

PILOT STUDY PROJECT TEAM SURVEY

16. My team members have good intuition or savvy about how to present themselves to others.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

17. My team members always seem to instinctively know the right things to say or do to influence others.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

18. My team members pay close attention to people's facial expressions.

Strongly Disagree	Disagree	Slightly Disagree	Netural	Slightly Agree	Agree	Strongly Agree
◯	◯	◯	◯	◯	◯	◯

PILOT STUDY PROJECT TEAM SURVEY

How effective is my team?

IN ANSWERING THE TEAM EFFECTIVENESS QUESTIONS, PLEASE EVALUATE WHAT YOU THINK ARE THE PERCEPTIONS AND BELIEFS OF THE TEAM RATHER THAN YOUR OWN PERSONAL BEHAVIORS OR BELIEFS!

Team effectiveness is normally assessed by output, quality, change, organizing and planning, interpersonal, value, and overall effectiveness. Please choose a response to each of the following questions that best matches what the team perceives is the level of effectiveness in the project team.

Remember, be honest there are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

AGAIN, PLEASE CHOOSE A RESPONSE THAT EVALUATES YOUR TEAM RATHER THAN YOUR OWN PERSONAL BEHAVIORS OR ATTITUDES!

You have reached the last set of questions. Almost done!

There are 26 questions in this section. Please indicate the degree of your agreement with each statement.

1. The team delivers its commitments.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

2. The team delivers its commitments on time.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

3. The team provides a volume of work consistent with established standards.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

4. The team is highly effective at implementing solutions.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

5. The team delivers important changes.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

6. The quality of the team's output is very high.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

7. The team performs duties accurately and consistently.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

PILOT STUDY PROJECT TEAM SURVEY

8. The team eliminates root problems, not just symptoms.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

9. The team faces new problems effectively.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

10. The team changes behavior to meet the demands of the situation.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

11. The team copes with change very well.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

12. The team sets goals and priorities for maximum efficiency.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

13. The team develops workable plans.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

14. The team works on important problems.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

15. The team has its priorities straight.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

16. The team communicates its progress.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

17. The team proactively communicates its progress.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

18. The team keeps everyone informed.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

Appendix B (Continued)

PILOT STUDY PROJECT TEAM SURVEY

19. The team keeps everyone informed on its progress.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

20. The team's contribution to the company is very valuable.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

21. The team makes valuable contributions to the company.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

22. The contributions of this team are very valuable to the company.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

23. The team is highly effective.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

24. The team is making very good progress on the team's charter.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

25. The team does very good work.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

26. The team does a very good job.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
◯	◯	◯	◯	◯

PILOT STUDY PROJECT TEAM SURVEY

FINISHED!!

Thank you so much! Again, none of your answers are tied to your identity and all responses will remain confidential.

Appendix C: Items Used to Measure Project Management Complexity (Aitken & Crawford, 2007)

1. Stability of the overall project context.
2. Number of distinct disciplines, methods, or approaches involved in performing the project.
3. Magnitude of legal, social, or environmental implications from performing the project.
4. Overall expected financial impact (positive or negative) on the project's stakeholders.
5. Strategic importance of the project to the organization or organizations involved.
6. Stakeholder cohesion regarding the characteristics of the product of the project.
7. Number and variety of interfaces between the project and other organizational entries.

Appendix D: Items Used to Measure Team Shared Leadership (Hoch et al., 2010)

Transformational leadership

1. My team members provide a clear vision of whom and what our team is.
2. My team members are driven by higher purposes or ideals.
3. My team members show enthusiasm for my efforts.
4. My team members encourage me to rethink ideas which had never been questioned before.
5. My team members seek a broad range of perspectives when solving problems.
6. My team members encourage me to go above and beyond what is normally expected of one (e.g., extra effort).

Transactional leadership

7. My team members and me have clear agreements and stick to those when we work together.
8. If I perform well, my team members will recommend more compensation.
9. My team members give me positive feedback when I perform well.
10. My team members give me special recognition when my work performance is especially good.

Directive leadership

11. My team members decide on my performance goals together with me.
12. My team members and I work together to decide what my performance goals should be.

13. My team members and I sit down together and reach agreement on my performance goals.
14. My team members work with me to develop my performance goals.

Empowerment (individual)

15. My team members encourage me to search for solutions to my problems without supervision.
16. My team members urge me to assume responsibilities on my own.
17. My team members encourage me to learn new things.
18. My team members encourage me to give myself a pat on the back when I meet a new challenge.

Empowerment (team)

19. My team members encourage me to work together with other individuals who are part of the team.
20. My team members advise me to coordinate my efforts with other individuals who are part of the team.
21. My team members urge me to work as a team with other individuals who are part of the team.
22. My team members expect that the collaboration with the other members in the team works well.

Aversive leadership

23. My team members try to influence me through threat and intimidation.
24. I feel intimidated by my team members' behavior.

25. My team members can be quite intimidating.

26. When my work is not up to par, my team members point it out to me.

Appendix E: Items Used to Measure Team Political Skill (Ferris et al., 2005)

1. My team members spend a lot of time and effort at work networking with others.
2. My team members are able to make most people feel comfortable and at ease around them.
3. My team members are able to communicate easily and effectively with others.
4. It is easy for my team members to develop good rapport with most people.
5. My team members understand people very well.
6. My team members are good at building relationships with influential people at work.
7. My team members are particularly good at sensing the motivations and hidden agendas of others.
8. When communicating with others, my team members try to be genuine in what they say and do.
9. My team members have developed a large network of colleagues and associates at work whom they can call on for support when the team really needs to get things done.
10. At work, my team members know a lot of important people and are well connected.
11. My team members spend a lot of time at work developing connections with others.
12. My team members are good at getting people to like them.
13. It is important that people believe that my team members are sincere in what they say and do.

Appendix E (Continued)

14. My team members try to show a genuine interest in other people.
15. My team members are good at using their connections and network to make things happen at work.
16. My team members have good intuition or savvy about how to present themselves to others.
17. My team members always seem to instinctively know the right things to say or do to influence others.
18. My team members pay close attention to people's facial expressions.

Appendix F: Items Used to Measure Team Effectiveness (Pearce & Sims, 2002)

1. The team delivers its commitments.
2. The team delivers its commitments on time.
3. The team provides a volume of work consistent with established standards.
4. The team is highly effective at implementing solutions.
5. The team delivers important changes.
6. The quality of the team's output is very high.
7. The team performs duties accurately and consistently.
8. The team eliminates root problems, not just symptoms.
9. The team faces new problems effectively.
10. The team changes behavior to meet the demands of the situation.
11. The team copes with change very well.
12. The team sets goals and priorities for maximum efficiency.
13. The team develops workable plans.
14. The team works on important problems.
15. The team has its priorities straight.
16. The team communicates its progress.
17. The team proactively communicates its progress.
18. The team keeps everyone informed.
19. The team keeps everyone informed on its progress.
20. The team's contribution to the company is very valuable.
21. The team makes valuable contributions to the company.
22. The contributions of this team are very valuable to the company.

Appendix F (Continued)

23. The team is highly effective.

24. The team is making very good progress on the team's charter.

25. The team does very good work.

26. The team does a very good job.

Appendix G: Calculation of r_{wg} Indices for Pilot Study

The following are the SPSS syntax steps undertaken in this study to calculate the interrater agreement indices (LeBreton & Senter, 2008).

STEP 1: Restructure the data prior to calculation of estimates for r_{wg}

Scale means were calculated for each of the rater/target combinations: project management complexity, shared leadership, political skill, and project team effectiveness. The original data was arranged in a format common to multilevel data: six targets (teams), rated on four items (study variables). Each team was rated by a different number of team members (raters). Restructuring the data was accomplished with the following SPSS syntax:

```
SORT CASES BY Team.
CASESTOVARS
/ID = Team
/GROUPBY = VARIABLE.
EXECUTE.
```

Output of the SPSS syntax organized the data in a multilevel format required by SPSS to calculate the values. Data was arranged by one mean score per team member (rater) per target (team). Because of the differing numbers of team members (raters) for each team, missing values were recoded as 999. The following was the SPSS syntax used to accomplish recoding the missing values:

```
RECODE CMPLXMean.1 to PSIMean.17 (MISSING = 999).
MISSING VALUES CMPLXMean.1 to PSIMean.17 (999).
EXECUTE.
```

STEP 2: Estimate interrater agreement indices, r_{wg}, for each study variable.

This sections shows project management complexity as an example. The data under the variables CMPLXMean.1 to CMPLXMean.17 are the ratings for project

management complexity that are responses by team members working in different teams. CMPLXMean.1 is the label referring to the first rating furnished for each team. CMPLXMean.2 is the second rating furnished for each team, and so forth, through CMPLXMean.17, the seventeenth rating furnished by each team. There are 64 raters (team members) distributed across six different teams. In order to justify aggregation of the scores for project management complexity, the interrater agreement index, $\mathbf{r_{wg}}$, for project management complexity was calculated by running the following SPSS syntax:

```
COMPUTE OBSCMPLX_var1 =
var(CMPLXMean.1,CMPLXMean.2,CMPLXMean.3,CMPLXMean.4,CMPLXMean.5,C
MPLXMean.6,CMPLXMean.7,CMPLXMean.8,CMPLXMean.9,CMPLXMean.10,CMP
LXMean.11,CMPLXMean.12,CMPLXMean.13,CMPLXMean.14,CMPLXMean.15,CM
PLXMean.16,CMPLXMean.17).
EXECUTE.
COMPUTE rwgvar1_un = 1-(OBSCMPLX_var1/2).
EXECUTE.
```

A new variable was created, OBSCMPLX_var1, which is the variance observed within each team across all the team members. The rwgvar1_un values are below. For all six teams, $r_{wg} > .80$. This suggests that there is strong agreement among the team members and that justification exists to aggregate the data to the team level for the main analysis.

Target (Team)	*rwgvar1_un*
Team 1	.86
Team 2	.98
Team 3	.95
Team 4	.90
Team 5	.90
Team 6	.90

Appendix H: Main Study Recruitment Email Script

Date: February 17, 2014

From: Name of Executive Contact, Title

(Company Name), in collaboration with Cathy Cockrell, a doctoral student at The University of Texas at Tyler, is currently participating in a research study involving project team work and project team effectiveness.

Cathy, together with other advisors and researchers at The University of Texas at Tyler, has created a web-based survey that is focused on better understanding complex projects, along with the team member skills and behaviors necessary for positive impact on project outcomes. I have given her approval to conduct this study and I am emailing you to make you aware of the web link that will allow you to complete the survey should you wish to participate. Cathy has had no involvement in the selection of participants for this survey.

You have been selected to participate in this research project because you have participated in (name of the Company project implementation) as a team member or leader currently, or during the previous few months. Your taking part in this web survey is completely voluntary and you may complete it during work hours. Should you choose to participate, your survey responses will be confidential and only seen by the research team at The University of Texas of Tyler. No supervisors or company administration will know whether you choose to participate. The survey instrument does not collect any identifying information and Cathy and her research team will make sure that the information collected is kept private and used only for the purpose of the study.

Cathy may use the data to support her research interests through publication or conference venues, but no identifiable characteristics will be used, including the identification of (the Company) or any project team member. Once the project is concluded, I will send a follow up email to everyone invited to participate (regardless of actual participation) that contains a link to access an executive summary of results. If you have any questions or concerns, just let me know or direct your questions to Dr. Gloria Duke, Chair of the The University of Texas at Tyler Institutional Review Board at (903) 566-7023, or gduke@uttyler.edu. If you are interested in participating in this study, please click on the following link by (date).

https://www.surveymonkey.com

Thank you,

(Name of Executive Contact)

Appendix I: Main Study Online Survey

Project Team Study Survey

WELCOME!

INFORMED CONSENT

The purpose of this survey is to better understand team member skills and behaviors necessary for positive impact on team effectiveness.

You have been selected to participate in this survey because you have recently participated in or are currently working on (name of the project team initiative) for (company name) as a team member, team leader, or project team sponsor.

This is a survey being conducted by a research team at the University of Texas at Tyler, in conjunction with a PhD dissertation in Human Resource Development. Your participation in this research study is completely voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time by clicking the EXIT button in the top right hand corner or by simply closing your browser. If you decide not to participate in this study or if you withdraw from participating at any time, there will be no consequences.

The procedure involves completing an online survey that will take about 15-20 minutes. After you thoughtfully read each question or statement, click the button that corresponds to your response. You may need to scroll down the page to answer all the questions. Click NEXT to continue after each page, and then click DONE when finished. At any time prior to clicking DONE, you can click PREV to go back to a previous page, or EXIT to withdraw.

Your responses will be confidential and no identifying information such as your name, department, email address, employee number, or any identifying computer software or hardware number, will be collected. No side effects or risks associated with your participation in this study are anticipated.

To protect your confidentiality, the surveys will not contain information that will personally identify you. All data is stored in a password protected electronic format. The results of this study will be used for scholarly purposes and may be shared with The University of Texas at Tyler representatives. Only a summary of the data will be shared through publication or conference venues. A summary of the data may also be shared with interested employees of (name of company) to assist the organization in understanding some of the factors that may lead to successful team performance.

This research has been reviewed and approved according to the University of Texas at Tyler Institutional Review Board (IRB) policies and procedures for research involving human subjects.

If you have any questions about the research study, please contact (names and email addresses of research team involved and also the company leader who sends this email to team members).

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Appendix I (Continued)

Project Team Study Survey

1. ELECTRONIC CONSENT: Please select your choice below.

Clicking on the "Agree" button below indicates that:

• you have read the above information

• you voluntarily agree to participate

• you are at least 18 years of age

If you do not wish to participate in the research study, please decline participation by clicking on the "Disagree" button.

- ○ Agree
- ○ Disagree

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Appendix I (Continued)

Project Team Study Survey

HOW EFFECTIVE IS YOUR TEAM?

IN ANSWERING THE TEAM EFFECTIVENESS QUESTIONS, PLEASE EVALUATE WHAT YOU THINK ARE THE PERCEPTIONS AND BELIEFS OF THE TEAM AS A WHOLE, RATHER THAN YOUR OWN PERSONAL PERCEPTIONS AND BELIEFS!

Team effectiveness is normally assessed by output value and quality, efficiency in organizing and planning, and overall effectiveness. Please choose a response to each of the following questions that best matches what the team perceives is the level of effectiveness in the project team.

Remember, be honest! There are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

There are 26 questions in this section. Please indicate the degree of your agreement with each statement.

1. The team delivers its commitments.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

2. The team delivers its commitments on time.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

3. The team provides a volume of work consistent with established standards.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

4. The team is highly effective at implementing solutions.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

5. The team delivers important changes.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

6. The quality of the team's output is very high.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

7. The team performs duties accurately and consistently.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

8. The team eliminates root problems, not just symptoms.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

Page 3

Project Team Study Survey

9. The team faces new problems effectively.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

10. The team changes behavior to meet the demands of the situation.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

11. The team copes with change very well.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

12. The team sets goals and priorities for maximum efficiency.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

13. The team develops workable plans.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

14. The team works on important problems.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

15. The team has its priorities straight.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

16. The team communicates its progress.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

17. The team proactively communicates its progress.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

18. The team keeps everyone informed.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

19. The team keeps everyone informed on its progress.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

Appendix I (Continued)

Project Team Study Survey

20. The team's contribution to the company is very valuable.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

21. The team makes valuable contributions to the company.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

22. The contributions of this team are very valuable to the company.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

23. The team is highly effective.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

24. The team is making very good progress on the team's charter.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

25. The team does very good work.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

26. The team does a very good job.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

Project Team Study Survey

SHARED LEADERSHIP IN YOUR TEAM

IN ANSWERING THE SHARED LEADERSHIP QUESTIONS, PLEASE EVALUATE WHAT YOU THINK ARE THE PERCEPTIONS AND BELIEFS OF THE TEAM AS A WHOLE, RATHER THAN YOUR OWN PERSONAL PERCEPTIONS AND BELIEFS!

Many teams have a formally appointed team leader, where leadership of the team comes solely from this individual. Shared leadership is informal and mutual influence among team members that serves as another source of leadership within the project team. Please choose a response to each of the following questions that best matches what the team perceives is the level of shared leadership in the project team.

Remember, be honest! There are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

There are 26 questions in this section. Please indicate the degree of your agreement with each statement.

1. My team members provide a clear vision of whom and what our team is.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

2. My team members are driven by higher purposes or ideals.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

3. My team members show enthusiasm for my efforts.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

4. My team members encourage me to rethink ideas which had never been questioned before.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

5. My team members seek a broad range of perspectives when solving problems.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

6. My team members encourage me to go above and beyond what is normally expected of one (e.g., extra effort).

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

7. My team members and I have clear agreements and stick to those when we work together.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

Project Team Study Survey

8. If I perform well, my team members will give positive feedback about me to my supervisor.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

9. My team members give me positive feedback when I perform well.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

10. My team members give me special recognition when my work performance is especially good.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

11. My team members decide on my performance goals together with me.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

12. My team members and I work together to decide what my performance goals should be.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

13. My team members and I sit down together and reach agreement on my performance goals.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

14. My team members work with me to develop my performance goals.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

15. My team members encourage me to search for solutions to my problems without supervision.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

16. My team members urge me to assume responsibilities on my own.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

17. My team members encourage me to learn new things.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

Project Team Study Survey

18. My team members encourage me to give myself a pat on the back when I meet a new challenge.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

19. My team members encourage me to work together with other individuals who are part of the team.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

20. My team members advise me to coordinate my efforts with other individuals who are part of the team.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

21. My team members urge me to work as a team with other individuals who are part of the team.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

22. My team members expect that the collaboration with the other members in the team works well.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

23. My team members try to influence me though threat and intimidation.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

24. I feel intimidated by my team members' behavior.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

25. My team members can be quite intimidating.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

26. When my work is not up to par, my team members point it out to me.

Definitely Not True	Not True	Neither True nor Untrue	True	Definitely True
○	○	○	○	○

Project Team Study Survey

POLITICAL SKILLS IN YOUR TEAM

IN ANSWERING THE POLITICAL SKILL QUESTIONS, PLEASE EVALUATE WHAT YOU THINK ARE THE PERCEPTIONS AND BELIEFS OF THE TEAM AS A WHOLE, RATHER THAN YOUR OWN PERSONAL PERCEPTIONS AND BELIEFS!

Political skill is defined as the ability to effectively understand others at work, and to use such knowledge to influence others to act in ways that enhance one's personal or team objectives. Please choose a response to each of the following questions that best matches what the team perceives is the level of political skill in the project team.

Remember, be honest! There are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

There are 18 questions in this section. Please indicate the degree of your agreement with each statement.

1. My team members spend a lot of time and effort at work networking with others.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

2. My team members are able to make most people feel comfortable and at ease around the team.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

3. My team members are able to communicate easily and effectively with others.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

4. It is easy for my team members to develop good rapport with most people.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

5. My team members understand people very well.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

6. My team members are good at building relationships with influential people at work.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

7. My team members are particularly good at sensing the motivations and hidden agendas of others.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Appendix I (Continued)

Project Team Study Survey

8. When communicating with others, my team members try to be genuine in what they say and do.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

9. My team members have developed a large network of colleagues and associates at work whom they can call on for support when the team really needs to get things done.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

10. At work, my team members know a lot of important people and are well connected.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

11. My team members spend a lot of time at work developing connections with others.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

12. My team members are good at getting people to like them.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

13. It is important that people believe that my team members are sincere in what they say and do.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

14. My team members try to show a genuine interest in other people.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

15. My team members are good at using their connections and network to make things happen at work.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

16. My team members have good intuition or savvy about how to present themselves to others.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Appendix I (Continued)

Project Team Study Survey

17. My team members always seem to instinctively know the right things to say or do to influence others.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

18. My team members pay close attention to people's facial expressions.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Appendix I (Continued)

Project Team Study Survey

YOUR RELATIONSHIP WITH YOUR TEAM MEMBERS

THE FOLLOWING QUESTIONS INVOLVE YOUR PERCEPTION OF THE OVERALL QUALITY OF THE RELATIONSHIP BETWEEN YOU AND THE MEMBERS OF YOUR TEAM.

The questions address issues such as the willingness among team members to provide each other with assistance and mutual understanding.

Remember, be honest! There are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

There are 10 questions in this section. Please indicate the degree of your agreement with each statement.

1. How often do you make suggestions about better work methods to other team members?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

2. Do other members of your team usually let you know when you do something that makes their jobs easier (or harder)?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

3. How often do you let other team members know when they have done something that makes your job easier (or harder)?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

4. How well do other members of your team recognize your potential?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

5. How well do other members of your team understand your problems and needs?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

6. How flexible are you about switching job responsibilities to make things easier for other team members?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

7. In busy situations, how often do other team members ask you to help out?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

Appendix I (Continued)

Project Team Study Survey

8. In busy situations, how often do you volunteer your efforts to help others on your team?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

9. How willing are you to help finish work that had been assigned to others?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

10. How willing are other members of your team to help finish work that was assigned to you?

Very Little Extent	Little Extent	Neutral	Great Extent	Very Great Extent
○	○	○	○	○

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Appendix I (Continued)

Project Team Study Survey

HOW COMPLEX IS THE MANAGEMENT OF THIS PROJECT?

Project management complexity is an attribute of projects and is determined by project stability, social or legal implications, financial impact, strategic importance, and number of methods involved in performing the project.

There are 7 questions in this section. Choose the descriptor that best fits the level of complexity in management of the project, considering the responsibilities of the project team manager or leader.

Remember, be honest! There are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind!

1. Stability of the overall project context. (Stability includes the project life-cycle, the stakeholders, the degree to which applicable methods and approaches are known, unproven concepts, uncertainty in the economic or political environment).

Very High	High	Moderate	Low or Very Low
○	○	○	○

2. Number of distinct disciplines, methods, or approaches involved in performing the project. (Project involves multiple functional disciplines).

Very High	High	Moderate	Low or Very Low
○	○	○	○

3. Magnitude of legal, social, or environmental implications from performing the project. (Addresses the potential external impact of the project, or effect on individuals or organizations outside of the company; potential for catastrophic failure; larger number of stakeholders; more diverse stakeholder population).

Very High	High	Moderate	Low or Very Low
○	○	○	○

4. Overall expected financial impact (positive or negative) on project stakeholders.

Very High	High	Moderate	Low or Very Low
○	○	○	○

5. Strategic importance of the project to the organization or organizations involved.

Very High	High	Moderate	Low or Very Low
○	○	○	○

6. Stakeholder cohesion regarding the characteristics of the product of the project.

Very High	High	Moderate	Low or Very Low
○	○	○	○

7. Number and variety of interfaces between the project and other organizational entities.

Very High	High	Moderate	Low or Very Low
○	○	○	○

Project Team Study Survey

COMPANY AND PROJECT TEAM DEMOGRAPHIC QUESTIONS

Please answer the following questions about your company and your project team. Remember that all information is completely confidential and none of the information is tied to your identity or that of your company.

1. Please choose the response that best matches the industry that your company or project team is in.

- ○ Retail
- ○ Manufacturing
- ○ Petroleum Refining
- ○ Wholesale
- ○ Consumer Product Goods
- ○ Logistics or Supply Chain
- ○ Consulting Services

2. What is your company size?

- ○ 100 or fewer employees
- ○ 101 – 500 employees
- ○ 501 – 1,000 employees
- ○ 1,001 – 10,000 employees
- ○ Over 10,000 employees

3. What is your project team size?

- ○ 5 – 10 members
- ○ 11 – 15 members
- ○ 16 – 20 members
- ○ 21 or more members

Project Team Study Survey

INDIVIDUAL DEMOGRAPHIC QUESTIONS

Please answer the following questions about yourself. (Remember that all information is completely confidential and none of the information is tied to your identity).

1. What is your gender?

- ○ Female
- ○ Male

2. What is your age?

- ○ 18 to 24
- ○ 25 to 34
- ○ 35 to 44
- ○ 45 to 54
- ○ 55 to 64
- ○ 65 or older

3. What is your ethnicity?

- ○ African American
- ○ Alaskan Native
- ○ Asian or P cific I lander
- ○ Caucasian
- ○ Hispanic
- ○ Native American
- ○ Other (please specify)

Other (please specify)

4. How many years have you worked for this company? (please specify)

- ○ Less than 1 year
- ○ Between 1 and 5 years
- ○ Between 5 and 10 years
- ○ Between 10 and 20 years
- ○ Over 20 years

Project Team Study Survey

5. What is the highest level of education you have completed?

- ○ Did not graduate from high school
- ○ Graduated from high school
- ○ Attended college
- ○ Graduated from college
- ○ Attended graduate school
- ○ Received a graduate degree

6. Choose the answer that best describes your role on your project team:

- ○ Team member
- ○ Project Team Leader
- ○ Project Team Sponsor

7. Choose the answer that best describes how long you participated as a team member, leader, or sponsor on the project.

- ○ 0 – 3 months
- ○ 3 – 6 months
- ○ 6 – 9 months
- ○ 9 – 12 months
- ○ 12 months and over

8. Do you supervise or manage other company employees that are not members of the project team?

- ○ Yes
- ○ No

Project Team Study Survey

FINISHED!!

Thank you so much! Again, none of your answers are tied to your identity and all responses will remain confidential.

Appendix J: Calculation of r_{wg} Indices for Main Study

The following are the SPSS syntax steps undertaken in this study to calculate the interrater agreement indices (LeBreton & Senter, 2008).

STEP 1: Restructure the data prior to calculation of estimates for r_{wg}

Scale means were calculated for each of the rater/target combinations: project management complexity, shared leadership, political skill, and team effectiveness. The original data was arranged in a format common to multilevel data: six targets (teams), rated on four items (study variables). Each team was rated by a different number of team members (raters). Restructuring the data was accomplished with the following SPSS syntax:

```
SORT CASES BY Team.
CASESTOVARS
/ID = Team
/GROUPBY = VARIABLE.
EXECUTE.
```

By running this syntax, the data was rearranged in a multilevel format that can be used by SPSS to calculate the values. Data was arranged by one mean score per team member (rater) per target (team). The number of team members in each team ranged from 3 to 16. Because there were differing numbers of team members (raters) for each team, missing values were recoded as 999. The following is the SPSS syntax used to accomplish recoding the missing values:

```
RECODE CMPLXMean.1 to PSIMean.16 (MISSING = 999).
MISSING VALUES CMPLXMean.1 to PSIMean.16 (999).
EXECUTE.
```

STEP 2: Estimate interrater agreement indices, r_{wg}, for each study variable.

Project management complexity is used as the example. The data under the variables CMPLXMean.1 to CMPLXMean.16 are the ratings for project management complexity that are responses by team members working in different teams. CMPLXMean.1 is the label referring to the first rating furnished for each team. CMPLXMean.2 is the second rating furnished for each team, and so forth, through CMPLXMean.16, the seventeenth rating furnished by each team. There were 209 raters (team members) distributed across 30 different teams. In order to justify aggregation of the scores for project management complexity, the interrater agreement index, $\mathbf{r_{wg}}$, for project management complexity was calculated by running the following SPSS syntax:

```
COMPUTE OBSCMPLX_var1 =
var(CMPLXMean.1,CMPLXMean.2,CMPLXMean.3,CMPLXMean.4,CMPLXMean.5,C
MPLXMean.6,CMPLXMean.7,CMPLXMean.8,CMPLXMean.9,CMPLXMean.10,CMP
LXMean.11,CMPLXMean.12,CMPLXMean.13,CMPLXMean.14,CMPLXMean.15,CM
PLXMean.16).
EXECUTE.
COMPUTE rwgvar1_un = 1-(OBSCMPLX_var1/2).
EXECUTE.
```

A new variable was created, OBSCMPLX_var1, that is the variance observed within each team across all the team members. The rwgvar1_un values are below. All values for r_{wg} for the 30 teams are greater than .80. This suggests that there is strong agreement among the team members and that justification exists to aggregate the data to the team level for the main analysis.

Appendix J (Continued)

Target (Team)	*rwgvar1_un*
Team 1	.83
Team 2	.88
Team 3	.94
Team 4	.82
Team 5	.79
Team 6	.87
Team 7	.88
Team 8	.89
Team 9	.98
Team 10	.98
Team 11	.72
Team 12	.91
Team 13	.94
Team 14	.88
Team 15	.97
Team 16	.91
Team 17	.92
Team 18	.93
Team 19	.95
Team 20	.85
Team 21	.89
Team 22	.90
Team 23	.86
Team 24	.87
Team 25	.95
Team 26	.85
Team 27	.78
Team 28	.95
Team 29	.88
Team 30	.94

Appendix K: Team-Member Exchange Quality Scale Items

The following items are from the 10-item team-quality exchange scale (Seers, 1989; Seers, Petty, & Cashman, 1995). According to Seers (1989), the team-member exchange quality scale measures "the quality of exchange relationships between work teams and their members" (p. 18). These items were added to the survey questionnaire at the recommendation of the dissertation committee for the purpose of future research. These items were not used in the pilot or main study analyses. Team members and project managers responded to these items, focusing on relationships with coworkers. The items will be rated on a Likert point scale from 1 ("Very Little Extent") to 5 ("Very Great Extent"). The Cronbach's alpha score for the TMX scale is $\alpha = .85$ (Seers, 1989).

1. How often do you make suggestions about better work methods to other team members?
2. Do other members of your team usually let you know when you do something that makes their jobs easier (or harder)?
3. How often do you let other team members know when they have done something that makes your job easier (or harder)?
4. How well do other members of your team recognize your potential?
5. How well do other members of your team understand your problems and needs?
6. How flexible are you about switching job responsibilities to make things easier for other team members?
7. In busy situations, how often do other team members ask you to help out?
8. In busy situations, how often do you volunteer your efforts to help others on your team?

Appendix K (Continued)

9. How willing are you to help finish work that had been assigned to others?

10. How willing are other members of your team to help finish work that was assigned to you?

Appendix L: Table 11

Table 11. Summary of Past Research Findings Compared to the Current Study

Past Research Findings	Study	Sample	New Insights from Current Study
Hypothesis 1: Project management complexity will positively influence team effectiveness			
Project complexity is negatively correlated to project execution success	Tatikonda & Rosenthal (2000)	120 product development managers	Project management complexity positively correlated to team effectiveness
Refinement and validation of the 7-Factor CIFTER scale for rating project management complexity	Aitken & Crawford (2007)	150 managers in 11 organizations	CIFTER measured project management complexity as a shared team property;
Managers of high complexity projects rated their own success more highly than managers of low complexity projects.	Muller & Turner (2007)	959 project managers from professional organizations	Project management complexity positively influenced team effectiveness; team members rated the team as a whole.
Systematic review of literature relevant to project complexity; creates a framework for assessing management of projects	Geraldi et al. (2010)	Literature Review	Quantitative study with project management complexity as the independent variable.
Project Complexity as a moderator of teamwork and project performance in construction projects in Taiwan.	Yang et al. (2011)	Survey of 200 construction project managers	Measured direct effect of Project Management Complexity on team effectiveness; measured and analyzed at the team level
Meta-analysis of team effectiveness literature; most empirical studies utilize context-specific measurements for effectiveness	Mathieu et al. (2008)	Literature during period of 1997-2007	Utilized a consistent team effectiveness measure across seventeen organizations, without context-specific factors

Appendix L (Continued)

Table 11. Summary of Past Research Findings Compared to the Current Study - continued

Past Research Findings	Study	Sample	New Insights from Current Study
Hypothesis 2: Shared leadership in project teams plays a mediating role in the relationship between project management complexity and project team effectiveness.			
Found shared leadership to be significant in explaining team effectiveness; developed a scale to measure team effectiveness	Pearce & Sims (2002)	71 change management teams in a large US automotive manufacturer	Current study included 30 project teams from 17 companies; shared leadership found to mediate the relationship between project management complexity and team effectiveness
Found team internal environment and coaching by an external leader as antecedent conditions for shared leadership	Carson et al. (2007)	59 teams comprised of MBA students from one large eastern US university	Current study tested relationships along with control measures of team composition (years of experience with the company, team member age).
The interaction of age diversity and coordination moderate the influence of shared leadership on team performance	Hoch et al. (2010)	26 project teams (96 individuals) from a German consulting company	Age diversity had no significant effect on the mediation effects of shared leadership on team effectiveness; shared leadership found to have mediating effects on team effectiveness
Shared leadership found to positively influence R&D team performance	Ishikawa et al. (2012)	119 R&D industrial research teams	Shared leadership influence on team effectiveness extended by including multiple types of projects in the study sample

Appendix L (Continued)

Table 11. Summary of Past Research Findings Compared to the Current Study - continued

Past Research Findings	Study	Sample	New Insights from Current Study
Hypothesis 2: Shared leadership in project teams plays a mediating role in the relationship between project management complexity and project team effectiveness.			
Found that relationship between internal team environment and team effectiveness is mediated by shared leadership	Daspit et al. (2013)	142 MBA students in a single university setting	Relationship between project management complexity (team characteristic) and team effectiveness was partially mediated by shared leadership
Found that work function and team autonomy moderate the relationship between shared leadership and team performance (non-significant relationship between shared leadership and team performance)	Fausing et al. (2013)	81 teams (552 employees) from a manu-facturing company in Denmark	Political skill found to be a moderator of the mediation effects of shared leadership in teams
Found that for teams with higher task complexity show lower influence of shared leadership on team effectiveness; task complexity moderated the shared leadership – team performance relationship	D'Innocenzo et al. (2014)	Meta-analysis of 43 studies	Found shared leadership partially mediated the relationship between project management complexity and team effectiveness
Found that the relationship between shared leadership and team effectiveness is stronger when the task work of teams is more complex	Wang et al. (2014)	Meta-analysis of 42 studies	Found shared leadership partially mediated the relationship between project management complexity and team effectiveness

Appendix L (Continued)

Table 11. Summary of Past Research Findings Compared to the Current Study - continued

Past Research Findings	Study	Sample	New Insights from Current Study
Hypothesis 3: Team political skill will moderate the strength of the mediated relationship between project management complexity and team effectiveness via shared leadership such that the mediated relationship will be stronger under high team political skill than under low team political skill.			
Leader political skill is significant in predicting team performance.	Ahearn et al. (2004)	100 casework teams in a large state welfare system	Measured political skill at the team level; found that political skill moderates the mediating effects of shared leadership on the relationship between project team complexity and team effectiveness
Development and validation of the political skill inventory (PSI); measurement scale at the individual leader level	Ferris et al., (2005)	undergraduate students and 148 workers in law firms in one city	Extended use of the PSI scale to measure political skill as a shared team property
Measured political skill at the team level; found positive relationship between team political skill and team effectiveness	Lvina (2011)	28 business work teams from one corporation	Broader operationalization of the PSI scale with analysis of 30 work teams across seventeen companies.

Biographical Sketch

Cathy Cockrell has extensive background in management and implementation of information technology projects in several industries, including retail, supply chain, government, and healthcare. Having a passion for project management, she is also a Project Management Professional (PMP), earning this designation from the Project Management Institute (PMI).

Cathy earned her MBA from the University of Texas at Tyler in 2000. She also holds a Bachelor of Science in Mathematics and Computer Science from Stephen F. Austin State University in Nacogdoches, Texas. Cathy began her Ph.D. studies in 2011 as a member of the inaugural doctoral cohort in the Ph.D. in Human Resource Development program at The University of Texas at Tyler. Her research interest focuses on teams and project teams in the workplace, particularly in the area of shared leadership and political skill and behavior in organizations.