

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Theses, Dissertations, & Student Scholarship:
Agricultural Leadership, Education &
Communication Department

Agricultural Leadership, Education &
Communication Department

Spring 4-17-2013

Shared Leadership in Dangerous Environments: Testing a Model for Military Teams Using Mixed Methods Research

Alex J. Ramthun

University of Nebraska-Lincoln, aramthun2@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/aglediss>



Part of the [Defense and Security Studies Commons](#), [Industrial and Organizational Psychology Commons](#), and the [Military and Veterans Studies Commons](#)

Ramthun, Alex J., "Shared Leadership in Dangerous Environments: Testing a Model for Military Teams Using Mixed Methods Research" (2013). *Theses, Dissertations, & Student Scholarship: Agricultural Leadership, Education & Communication Department*. 95.
<https://digitalcommons.unl.edu/aglediss/95>

This Article is brought to you for free and open access by the Agricultural Leadership, Education & Communication Department at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Theses, Dissertations, & Student Scholarship: Agricultural Leadership, Education & Communication Department by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

SHARED LEADERSHIP IN DANGEROUS ENVIRONMENTS:
TESTING A MODEL FOR MILITARY TEAMS USING MIXED METHODS
RESEARCH

by

Alex J. Ramthun

A DISSERTATION

Presented to the Faculty of
The Graduate College at the University of Nebraska
In Partial Fulfillment of Requirements
For the Degree of Doctor of Philosophy

Major: Human Sciences

(Leadership Studies)

Under the Supervision of Professor Gina S. Matkin

Lincoln, Nebraska

May, 2013

SHARED LEADERSHIP IN DANGEROUS ENVIRONMENTS:
TESTING A MODEL FOR MILITARY TEAMS USING MIXED METHODS
RESEARCH

Alex J. Ramthun, Ph.D.

University of Nebraska, 2013

Adviser: Gina S. Matkin

The three articles in this dissertation investigate shared leadership in dangerous environments. Specifically, the research explores the relationship between shared leadership in military teams and performance in dangerous contexts using an explanatory sequential mixed methods research design.

In a field study, the dissertation examined the influence of shared leadership on team performance for 51 military combat teams in a simulated dangerous environment. To simulate the dangerous context, the study employed a military tactical urban fighting complex, paintball weapons, role players, and a dynamic combat scenario. Using social network analysis techniques and after controlling for team diversity and combat experience, the study found the density measure of shared leadership to be positively and significantly related to team performance, accounting for 40% of the variance in team performance. This research also found both the centralization measure and density/centralization interaction effect to be insignificantly related to team performance. A stepwise multiple regression analysis found the density measure of shared leadership and the control variable of team combat experience as the best predictors of team performance, accounting for 49% of the variance in team performance.

The study also collected qualitative data during and following the field study. Analyzing written observations and definitions of leadership from the 208 participants during the field study, the results found the project's measure of shared leadership appropriately reflected the perceived leadership of the participants. Additionally, post-study interviews of four shared leadership scholars and four dangerous environment practitioners found the quantitative results appropriately reflected the phenomenon of shared leadership in teams under extreme situations.

The results suggest a promising future for shared leadership in teams operating in dangerous or extreme contexts. The study found military teams relying on multiple individuals for influence in a combat scenario performed at higher levels than those functioning under a vertical model. These results do not imply an end of vertical leadership in dangerous or conventional contexts. Rather, the findings suggest shared leadership may be as viable of a leadership framework as traditional models of downward influence during extreme situations.

Table of Contents

CHAPTER I	1
Introduction	2
Research Problem.....	2
Research Questions	4
Quantitative.....	4
Qualitative.....	4
Mixed	4
Purpose	5
Significance.....	6
Philosophical Foundations	6
References	8
 CHAPTER II: Highway to the Danger Zone: Investigating Measurements and Boundary Conditions for Shared Leadership in Teams Operating in Dangerous Environments	11
Abstract of Article	12
Introduction	13
Literature Review	17
Shared Leadership.....	17
Social Network Analysis	18
Dangerous Environmental Context.....	20
Social Power	22
Conceptual Model and Propositions	24
Shared Leadership, Team Performance, and SNA	24
Dangerous Environments as a Moderator	26
Social Power Distribution as a Moderator	28
Discussion	30
Theoretical and Practical Implications	30
Limitations	31
Recommendations.....	33
Conclusion	35
References	36
 CHAPTER III: Living Dangerously: Shared Leadership and Performance for Teams in Dangerous Environments	49
Abstract of Article.....	50
Introduction	51
Literature Review	54
Shared Leadership.....	54
Social Network Analysis.....	55
Dangerous Environmental Context.....	57

Hypotheses	59
Method	63
Participants.....	63
Procedure	64
Measures	67
Shared Leadership.....	67
Team Performance	68
Control Variables	69
Qualitative Data Collection for Construct Validity	70
Analysis and Results	71
Quantitative.....	71
Qualitative.....	75
Primary Themes	75
Process	75
Influence	76
Common Goals	78
Supporting Themes	78
Situational awareness	78
Follower awareness.....	79
Discussion	80
Implications.....	82
Limitations and Recommendations.....	84
Conclusion	86
References	88
Appendix A: Quantitative Survey and Qualitative Response Questions	96
Appendix B: Team Performance Scale	103
CHAPTER IV: Dangerous Dynamism: A Case Study of Experts' Perspectives on Shared Leadership in Dangerous Environments.....	113
Abstract of Article.....	114
Introduction	115
Research Question	116
Method	116
Qualitative Approach Rationale	116
Tradition of Inquiry.....	117
Sample	118
Data Collection Strategy	120
Analysis	121
Organization and Exploration.....	121
Codes and Themes	121
Verification Procedures	122
Results	123
Participant Information	123

Participant 1	123
Participant 2	124
Participant 3	124
Participant 4	124
Participant 5	125
Participant 6	125
Participant 7	125
Participant 8	126
Primary Themes	126
Mutual Influence	126
Leadership Emergence	128
Secondary Themes	129
Dangerous Dynamism	129
Distrusted Knowledge, Skills, and Abilities	132
Discussion	133
Implications	134
Limitations and Recommendations	135
Conclusion	135
References	136
Appendix: Interview Protocol and Questions	138
 CHAPTER V	 142
Introduction	143
Mixed Methods	143
Chapter Findings, Implications, and Summaries	146
Limitations and Recommendations	149
Conclusion	151
References	152
 APPENDIX	 155
Appendix A: Phase I Approved IRB Informed Consent Form / Letter	156
Appendix B: Phase II Approved IRB Informed Consent Form / Letter	157
 LIST OF FIGURES AND TABLES	
Chapter II	
Figure 1: Visual depiction of the propositions forming a conceptual model of shared leadership in dangerous environments	46
Figure 2: Example Network Sociograms	47
Table 1: Centralized Network Table Examples	48
Chapter III	
Figure 1: Example Network Sociograms	105

Table 1: Centralized Network Table Examples	106
Table 2: Descriptive Statistics and Correlations	107
Table 3: Summary of Regression Analysis for Hypothesis 1	108
Table 4: Summary of Regression Analysis for Hypothesis 2	109
Table 5: Summary of Regression Analysis for Hypothesis 3	110
Table 6: Summary of the Stepwise Regression Analysis	111
Table 7: Codes and Themes	112
Chapter IV	
Table 1: Codes and Themes	141
Chapter V	
Figure 1: Mixed Methods Design	154

CHAPTER I:

Shared Leadership in Dangerous Environments: Testing a Model for Military Teams

Using Mixed Methods Research

Shared Leadership in Dangerous Environments: Testing a Model for Military Teams Using Mixed Methods Research

Modern organizations continue to face an increasing number of challenges to success: uncertainty (Seeger, Sellnow, & Ulmer, 2003), dynamic change (Henderson & Stern, 2004), globalization (Hofstede, Hofstede, & Minkov, 2010), complex work tasks (Gronn, 2000, 2002), and dangerous operating environments (Hannah, Campbell, & Matthews, 2010). To overcome these challenges, organizations have begun to restructure workforces from rigid hierarchies of individuals to high performing teams (Day, Gronn, & Salas, 2004, 2006; Manz & Sims, 1993). These teams, rather than using hierarchical leadership to solely direct work efforts and meet objectives (Kozlowski & Bell, 2003), rely on multiple team members with diverse knowledge and experience (Pearce, 2004) to influence others through the decentralization and distribution of leadership (Carson, Tesluk, & Marrone, 2007; Pearce & Sims, 2002). This team—multidirectional— influence approach is called shared leadership: a dynamic, interactive influence process among individuals in groups where team members lead one another to achieve organizational objectives (Pearce & Conger, 2003).

Research Problem

Shared leadership represents a relatively new concept in the field of management. The theory has seen increasing legitimization and confirmation over the past decade (Pearce, Hoch, Jeppesen, & Wegge, 2010). Seminal studies have found teams sharing leadership predict higher levels of performance when compared to teams employing vertical leadership (Pearce & Sims, 2002). Current shared leadership research has focused on answering two important questions: who shares leadership and how do teams

share leadership (Manz, Manz, Adams, & Shipper, 2010; Muethel & Hoegl, 2010; Small & Rentsch, 2010; Weibler & Rohn-Endres, 2010)? As with the development of leadership theories in the field of management, the maturation of shared leadership requires investigations of mediating and moderating models to further contribute to the study and practice of leadership (Hunt, 1999; Reichers&Schneider, 1990). These types of investigations enable researchers to move the focus away from addressing who and how to answering: where and when to share leadership (Pearce, 2004)?

With many unexplored boundary conditions and the circumstances under which the predictions of the theory hold (Dubin, 1976), management scholars have an opportunity to answer the calls of multiple researchers to investigate hybrid forms of group leadership models in varying contexts (Day et al., 2004, 2006; Pearce & Conger, 2003; Pearce et al., 2010). As the current body of shared leadership studies has focused on conventional contexts (Carson et al., 2007; Pearce, Yoo, & Alavi, 2004; Small & Rentsch, 2010), little research has examined shared influence within extreme or dangerous environmental context, where teams face highly dynamic and unpredictable environments with the outcomes of leadership possibly resulting in severe physical or psychological injury (Campbell, Hannah, &Matthews, 2010). Organizations—such as military (special forces, aircrew, embedded training teams, provincial reconstruction teams, etc.), emergency services (firefighting, search and rescue, emergency medical teams, disaster response teams, etc.), law enforcement (task forces, special weapons and tactics teams, hostage rescue teams, etc.), intelligence services, and aircrew (airlines, cargo, corporate, private, rescue, military, etc.)—employ teams in dangerous

environments (Campbell et al., 2010). However, the relationship between the presence of increasing levels of danger, shared leadership, and team performance remains unclear.

These unresolved boundary conditions of extreme context—asking where and when—represent theoretical gaps in new phases of dangerous contextual, team, and shared leadership research. They also represent areas to make strong theoretical, empirical, and practical contributions to the field of leadership. As organizations continue to employ high-performing teams to achieve critical objectives in dangerous contexts and as shared leadership organizational practices increase in popularity, the need to form a model, conduct empirical research, and deliver practical guidance concerning the possible application of shared leadership in dangerous environments has become increasingly important.

Research Questions

Quantitative

What is the relationship between shared leadership and team performance for military teams operating in dangerous environments?

What model of leadership best predicts higher team performance for military teams operating in dangerous environments?

Qualitative

How do individuals in military teams operating in dangerous environments describe their definitions and observations of leadership?

How do subject matter experts describe and explain shared leadership in dangerous environments for military combat teams?

Mixed

How do subject matter experts on shared leadership and military teams operating in dangerous environments explain and support the predictive results?

Purpose

This study shall address shared leadership in dangerous environments for military teams. An explanatory sequential mixed methods design shall be used, involving the collection of qualitative data after a quantitative phase in order to explain and follow up on the quantitative data in more depth. In the first, quantitative phase of the study, leadership and team performance data shall be collected from military participants executing combat-like scenarios at an urban combat training center near Camp Ashland, Nebraska. This phase shall test a model of shared leadership in dangerous environments, demonstrating how shared leadership and social power distribution relate to team performance. The second, qualitative phase shall be conducted in order to explain quantitative results. In this exploratory follow-up, shared leadership in dangerous environments shall be tentatively explored with experts in the fields of shared leadership and military combat in to provide rich description and explain the initial quantitative results.

To meet these objectives, this dissertation takes the structure of three distinct journal articles. The first article reviews the theoretical foundations—shared leadership, dangerous environments, and social power—in order to develop and present a conceptual model and propositions for the boundary conditions of shared leadership. This article acts as a literature review for this dissertation. The second article presents an empirical field study, quantitatively investigating the relationships between shared leadership and team performance. The final article is a qualitative study explaining the quantitative

results in order to provide rich description of the empirical findings. The three-article approach enables the doctoral candidate to effectively capture and publish the primary elements and findings of the project.

Significance

As organizations continue to employ high-performing teams to achieve critical objectives in dangerous contexts and as shared leadership organizational practices increase in popularity, the need to conduct empirical research and deliver practical guidance concerning the possible application of shared leadership in dangerous environments has become increasingly important. The results from this empirical study may possess the potential to fill the critical theoretical gap in research and provide organizations with future guidance to form, train, and utilize teams employing shared leadership in dangerous situations to achieve objectives. In these theoretical and practical contexts, this research may significantly add to the field of study.

Philosophical Foundations

Research questions guide investigations and are focused on the unknown elements of a phenomenon of interest (Teddlie & Tashakkori, 2009). The qualitative and quantitative research questions for this study present opposing worldviews. The qualitative research questions describe a constructivist paradigm seeking inductive, biased description and understanding from the participants (Creswell & Plano Clark, 2011). In contrast, the quantitative research questions present a post-positivism worldview pursuing deductive, biased, empirical evaluation and measurement of a given phenomenon (Teddlie & Tashakkori, 2009). In order to answer the conflicting paradigmatic research questions in this study, the researcher embraces a pragmatic

worldview, focusing on the consequences of research and the importance of the research questions rather than specific methodology (Creswell & Plano Clark, 2011). The pragmatic paradigm enables the researcher to accept multiple realities and practically combine and apply multiple approaches in order to achieve “what works” to solve the research problem (Teddlie & Tashakkori, 2009, p. 7). The pragmatic worldview drives the research to employ a mixed methods approach to answer all of the research questions and to solve the research problem.

REFERENCES

- Campbell, D., Hannah, S., & Matthews, M. (2010). Leadership in military and other dangerous contexts: Introduction to the special topic issue. *Military Psychology*, 22(Suppl. 1), S1-S14.
- Carson, J., Tesluk, P., & Marrone, J. (2007). Shared leadership in teams: An investigation of antecedent conditions and performance. *Academy of Management Journal*, 50(5), 1217-1234.
- Creswell, J., & Plano Clark, V. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.
- Day, D., Gronn, P., & Salas, E. (2004). Leadership capacity in teams. *Leadership Quarterly*, 15(6), 857-880.
- Day, D., Gronn, P., & Salas, E. (2006). Leadership in team-based organizations: On the threshold of a new era. *Leadership Quarterly*, 17(3), 211-216.
- Dubin, R. (1976). Theory building in applied areas. In M. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 17-39). Chicago: Rand McNally.
- Gronn, S. (2000). Distributed properties: A new architecture for leadership. *Educational Management and Administration*, 28, 317-338.
- Gronn, P. (2002). Distributed leadership as a unit of analysis. *Leadership Quarterly*, 13, 423-451.
- Hannah, S., Campbell, D., & Matthews, M. (2010). Advancing a research agenda for leadership in dangerous contexts. *Military Psychology*, 22(Suppl. 1), S157-S189.
- Henderson, A., & Stern, I. (2004). Selection-based learning: The coevolution of internal and external selection in high velocity environments. *Administrative Science Quarterly*, 49(1), 39-75.
- Hofstede, G., Hofstede, G., & Minkov, M. (2010). *Culture and organizations: Software of the mind* (3rd ed.). New York: McGraw-Hill.
- Hunt, J. (1999). Transformational/charismatic leadership's transformation of the field: An historical essay. *Leadership Quarterly*, 10(2), 129-144.
- Kozlowski, S., & Bell, B. (2003). Work groups and teams in organizations. In W. C. Borman, D. Ilgen, & R. Klimoski (Eds.), *Comprehensive handbook of psychology: Industrial and organizational psychology* (pp. 333-375). New York: John Wiley.

- Manz, C., Manz, K. Adams, S. & Shipper, F. (2010) A model of values-based shared leadership and sustainable performance. *Journal of Personnel Psychology*, 9(4), 212-217.
- Manz, C., & Sims, H. (1993). *Business without bosses: How self-managing teams are building high-performing companies*. New York: John Wiley and Sons.
- Muethel, M., & Hoegl, M. (2010). Cultural and societal influences on shared leadership in globally dispersed teams. *Journal of International Management*, 16(3), 234-246.
- Pearce, C. (2004). The future of leadership: Combining vertical and shared leadership to transform knowledge work. *Academy of Management Executive*, 18(1), 47-57.
- Pearce, C., & Conger, J. (Eds.). (2003). *Shared leadership: Reframing the hows and whys of leadership*. Thousand Oaks, CA: Sage.
- Pearce, C., Hoch, J., Jeppesen, H., & Wegge, J. (2010). New forms of management: Shared and distributed leadership in organizations. *Journal of Personnel Psychology*, 9(4), 151-153.
- Pearce, C., & Sims, H. (2002). Vertical versus shared leadership as predictors of the effectiveness of change management teams: An examination of aversive, directive, transactional, transformational, and empowering leader behaviors. *Group Dynamics: Theory, Research, and Practice*, 6(2), 172-197.
- Pearce, C., Yoo, Y., & Alavi, M. (2004). Leadership, social work, and virtual teams: The relative influence of vertical versus shared leadership in the nonprofit sector. In R. Riggio & S. Smith Orr (Eds.), *Improving leadership in nonprofit organizations* (pp. 160-203). San Francisco: Jossey-Bass.
- Reichers, A., & Schneider, B. (1990). Climate and culture: An evolution of constructs. In D. Schneider (Ed.), *Organizational climate and culture* (pp. 5-39). San Francisco: Jossey-Bass.
- Seeger, M., Sellnow, T., & Ulmer, R. (2003). *Communication and organizational crisis*. Westport, CT: Praeger.
- Small, E., & Rentsch, J. (2010). Shared leadership in teams: A matter of distribution. *Journal of Personnel Psychology*, 9(4), 203-211.
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks, CA: Sage.

Weibler, J., & Rohn-Endres, S. (2010). Learning Conversation and Shared Network Leadership. *Journal of Personnel Psychology*, 9(4), 181-194.

CHAPTER II:

Article 1

Highway to the Danger Zone:

Investigating Measurements and Boundary Conditions for Shared Leadership

in Teams Operating in Dangerous Environments

A. J. Ramthun, L. J. McElravy, and Gina S. Matkin

University of Nebraska-Lincoln

Department of Agricultural Leadership, Education, and Communication

Manuscript submitted to the

Journal of Leadership and Organizational Studies

Abstract

The authors conceptually investigate the measurements and boundary conditions for shared leadership in teams. They propose the use of social network analysis (SNA) research designs, through the measure of both density and distribution of leadership, as a comprehensive measure of shared leadership. Additionally, this article presents a conceptual model of shared leadership and team performance, integrating dangerous context and social power distribution in teams as moderating variables. The model and propositions extend prior scholarly efforts and bridge theoretical gaps by integrating ideas and research approaches from the fields of management, leadership, psychology, and sociology. Limits and recommendations are discussed.

Keywords: shared leadership, social network analysis, dangerous environments, social power, teams

Highway to the Danger Zone:

Investigating Measurements and Boundary Conditions for Shared Leadership in Teams Operating in Dangerous Environments

Contemporary organizations face an increasing number of challenges to performance: cultural difference (Harms, Han, & Chen, 2012; Matkin & Barbuto, 2012; Ramthun & Matkin, 2012), globalization (Hofstede, Hofstede, & Minkov, 2010; Muczyk & Holt, 2008; Story & Barbuto, 2011), dynamically changing work environments (Dool, 2010; Gundersen, Hellesøy, & Raeder, 2012; Henderson & Stern, 2004), complexity (Gronn, 2000, 2002; Manz, Pearce, & Sims, 2009; Sweetman, 2010; Uhl-Bien & Marion, 2008; Uhl-Bien, Marion, & McKelvey, 2007), unethical employee conduct (DeCelles & Pfarrer, 2004; Johnson, 2008; Pearce, Manz, & Sims, 2008), and dangerous operating environments (Hannah, Campbell, & Matthews, 2010; Hannah, Uhl-Bien, Avolio, & Cavarretta, 2009). To prevail while negotiating these obstacles, organizations have begun to transform from primarily top-down or centralized command and control structures of individuals (Dunphy, 2000; Pearce, Manz, & Sims, 2009) into self-managed teams (Manz & Sims, 1987, 1993, 2001; Millikin, Horn, & Manz, 2010; Solansky, 2008). These teams, rather than using rigid hierarchies of leadership to solely direct work efforts and meet objectives (Kozlowski & Bell, 2003), rely on one another, as team members, to exhibit leadership when appropriate based on their knowledge, skills, abilities, experience, and the situation (Pearce, 2004; Pearce et al., 2009). By broadly sharing power and influence with team members—rather than centralizing leadership around a single, hierarchical leader—teams may achieve a variety of positive outcomes (Bergman, Rentsch, Small, Davenport, & Bergman, 2012; Khasawneh, 2011; Pearce, 1997; Shamir

& Lapidot, 2003) and greater performance (Avolio, Jung, Murry, & Sivasubramaniam, 1996; Carson, Tesluk, & Marrone, 2007; Pearce & Sims, 2002). This team—multidirectional—influence approach is called shared leadership: a dynamic, interactive, social influence process among individuals in teams where members lead one another to achieve common objectives (Pearce & Conger, 2003).

Shared leadership represents a relatively new concept in the field of management. The theory has seen increasing legitimization and confirmation in management literature (Pearce, Hoch, Jeppesen, & Wegge, 2010). As with the development of leadership theories in the field of management, the maturation of shared leadership requires new investigations of more accurate measures of the phenomena (Conger & Pearce, 2003), boundary conditions (Antonakis et al., 2004), and moderating models (Reichers & Schneider, 1990) to further contribute to the study and practice of leadership (Hunt, 1999). At its present stage of development, the concept lacks a reliable measure with wide acceptance in the field (Gockel & Werth, 2010; Conger & Pearce, 2003). Additionally, shared leadership has many unexplored boundary conditions, the circumstances under which the predictions of the theory hold (Dubin, 1976). These areas of shared leadership theory and research require further attention from scholars to broaden our present understanding of the phenomena (Conger & Pearce, 2003).

Gockel and Werth (2010) and Conger and Pearce (2003) have called on scholars to address the issue of accurately measuring shared leadership. A majority of quantitative shared leadership research has employed varying types of conventional survey scales aggregating group members' assessments concerning the amount of shared influence and specific influence tactics in teams as a whole (Gockel & Werth, 2010), such as the shared

leadership questionnaire (Pearce & Sims, 2002). However, it remains unclear how each member contributes to the leadership of the team or how the distribution of leadership is actually assessed using these methods (Gockel & Werth, 2010). One approach to provide greater clarity to overcome these scaling limitations may be the use of social network analysis (SNA). Though some researchers have scaled shared leadership using SNA approaches (Carson et al., 2007; Small & Rentsch, 2010), they have failed to measure both the strength of team leadership—density—and the distribution of leadership—centralization—which are both required for accurately measuring shared leadership (Mayo, Meindl, & Pastor, 2003).

Management scholars also have opportunities to advance the field's comprehension of shared leadership's boundary conditions by answering the calls of multiple researchers to investigate hybrid forms of group/team leadership models in varying contexts (Day, Gronn, & Salas, 2004, 2006; Pearce & Conger, 2003; Pearce et al., 2010). As the current body of shared leadership studies has focused on conventional contexts (Carson et al., 2007; Pearce, Yoo, & Alavi, 2004; Small & Rentsch, 2010), little research has examined shared influence within extreme or dangerous environments (Mills, 2011), where teams routinely face highly dynamic and unpredictable environments with the outcomes of leadership possibly resulting in severe physical or psychological injury (Campbell, Hannah, & Matthews, 2010; Sweeney, Matthews, & Lester, 2011). Organizations, such as military (special forces, aircrew, embedded training teams, provincial reconstruction teams, etc.), emergency services (firefighting, search and rescue, emergency medical teams, disaster response teams, etc.), law enforcement (task forces, special weapons and tactics teams, hostage rescue teams, etc.),

intelligence services (direct action teams, etc.), and aviation (airlines, cargo, corporate, private, rescue, military, etc.) regularly employ teams in dangerous environments (Boe, Woolley, & Durkin, 2011; Campbell et al., 2010; Kolditz, 2007). However, the relationship between the presence of increasing levels of danger, shared leadership, and team performance remains unclear. Additionally, other possible moderating variables, such as the distribution of social power (Conger & Pearce, 2003; French & Raven, 1959; Raven, 1993) in teams, may also strengthen or weaken the relationship between shared influence and performance. Similar to extreme contexts, scholars have failed to examine social power distribution in teams for its relationship to shared leadership and performance. These unresolved measurement issues and boundary conditions represent gaps in present phases of extreme contextual, team, and shared leadership theoretical development and empirical research.

This present conceptual investigation of shared leadership has three primary purposes. First, advance the field's theoretical understanding of shared leadership by proposing the use of SNA (density and centralization) to measure shared influence. Second, advance the field's theoretical comprehension of the factors bounding and moderating shared leadership. Finally, this article uses its important theoretical contribution to stimulate new empirical studies providing researchers and organizations with a model to better understand the factors surrounding the employment of shared leadership in teams. To meet these scholarly objectives, this conceptual investigation first reviews the theoretical foundations of shared leadership, SNA, dangerous environments, and social power. Second, the authors develop a conceptual model and propositions for the use of SNA to measure shared influence and identifying the

relationships between boundary conditions and moderators of shared leadership and team performance. Finally, the article concludes with a discussion of the theoretical and practical implications, limitations, and recommendations for future directions of research.

Literature Review

Shared Leadership

Pearce and Conger (2003) have defined shared leadership as a “dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both” (p. 1). Management researchers view shared leadership as an emergent team property (Pearce & Sims, 2002), resulting from the distribution of leadership influence across multiple team members (Carson et al., 2007). Unlike traditional models of vertical leadership—the process of centralizing power and influence through a hierarchical leader (Pearce et al., 2009)—shared leadership uses the decentralization and sharing of power and influence among team members to achieve effectiveness (Pearce, Conger, & Locke, 2008). In teams characterized by vertical leadership, the organization’s structure may represent the primary contributing factor to the influence process (Conger & Kanungo, 1998); however, when leadership is shared, the influence process may emerge due to situational factors (Pearce & Conger, 2003; Pearce et al., 2009). As a result, shared leadership may act as a complement to vertical leadership when structure fails to achieve leadership effectiveness (Pearce, Manz, et al., 2008).

Shared leadership, supporting mutual influence rooted in the social interactions among group members, significantly improves team and organizational performance (Carson et al., 2007; Day et al., 2004; Ensley, Pearce, & Hmieleski, 2006; Pearce &

Sims, 2002; Pearce et al., 2004; Perry, Pearce, & Sims, 1999). Additionally, investigations of shared leadership have found significant links to other positive outcomes, such as team potency and trust (Boies, Lvina, & Martens, 2010) and sustainability (Manz, Manz, Adams, & Shipper, 2010). However, shared leadership may not be effective in every situation or act as a sole replacement to vertical leadership (Pearce & Conger, 2003). Followers lacking situational knowledge, skills, and abilities (KSA) may not be able to effectively contribute to the shared leadership process (Conger & Pearce, 2003).

Social Network Analysis

The primary quantitative methods for measuring shared leadership include evaluating the team as a whole (Avolio et al., 1996; Pearce & Sims, 2002; Sivasubramaniam, Murry, Avolio, & Jung, 2002) or as a social network (Carson et al., 2007; Mayo et al., 2003; Mehra, Smith, Dixon, & Robertson, 2006). Researchers measuring shared leadership asking respondents, via surveys, to rate the leadership behaviors of their team as a whole assume the respondents can mentally aggregate the contribution of leadership from all team members; researchers then use the mean responses of the individuals on the team to make interpretations concerning shared leadership (Avolio, Sivasubramaniam, Murry, Jung, & Garger, 2003). Though this method reduces the burden on respondents, it fails to measure the distribution, concentration, and relational patterns of leadership in the team (Carson et al., 2007; Mayo et al., 2003). Furthermore, it remains unclear how each member arrives at their team rating. Gockel and Werth (2010) ask several questions highlighting the problem with using team members' perceptions of team leadership: "Who is the reference? Do they

average all team members' behaviors? Or do they base their judgments on the behavior of the most visible, influential, or sympathetic team member?" (p. 174).

In order to demonstrate that shared leadership as opposed to a single leader or a few leaders are solely responsible for creating a team environment leading to positive team outcomes, shared leadership may be measured using SNA (Mayo et al., 2003). Gockel and Werth (2010) conducted a review of shared leadership measuring techniques and suggested SNA may be used when researchers have interest in studying team level outcomes due to SNA's ability to account for the multidirectional and relational ties for a team. Since the 1980s, SNA has seen extensive use in the field of management and organizational studies (for a review, see Borgatti & Foster, 2003). As a methodological tool, SNA enables researchers to understand the relational ties in a network and consists of three main elements—the network, the nodes, and the relational ties (Scott, 2000).

The field of leadership has recently begun to more heavily invest in SNA as a methodological tool (Hoppe & Reinelt, 2010). More specifically, Yukl (2010a) suggests the literature from social network theory can be used to provide insight into shared leadership. SNA may not only be used to measure the degree to which team members perceive their team's shared leadership—network density—but SNA may also be used to explore how that leadership is distributed—centralization (Mehra et al., 2006; Small & Rentsch, 2010).

Only a small number of studies have explored shared leadership using SNA. Mehra et al. (2006) used qualitative coding of social network diagrams to explore the relationship between shared leadership and team performance. The quantitative methods of analyzing social networks are much more accessible to researchers through the use of

computer programs (e.g., UCINET) and provide a much more rigorous and thorough examination of social network data. Carson et al. (2007) calculated network density as a measure of shared leadership; whereas, Small and Rentsch (2010) focused on network centralization—the distribution of leadership—to measure shared leadership. However, researchers suggest network density and centralization should be combined to measure shared leadership using SNA (Gockel & Werth, 2010; Mayo et al., 2003).

Dangerous Environmental Context

Campbell et al. (2010) have narrowly classified dangerous environments as “those in which leaders or their followers are personally faced with highly dynamic and unpredictable situations and where the outcomes of leadership may result in severe physical or psychological injury (or death) to unit members” (p. S3). Environmental dynamism represents the heart of extreme context (Sweeney et al., 2011), where leaders find it difficult to predict change and face increasing uncertainty (Dess & Beard, 1984). Aldrich (1979) has argued the nature of environmental dynamism embodies turbulent, fluctuating changes in stability and instability. In dynamic settings, leaders discover this type of change to be obscure and difficult to plan against. Obsolescence, as seen in cellular telecommunications technology, quickly occurs with the introduction of a new technology, creating a rapid decrease in demand for firms employing older technology; this type of change represents one of the challenges leaders face in dynamic environments (Henderson & Stern, 2004). Organizations operating in dynamic environments may experience sharp, rapid, and discontinuous change in demand, competitors, technology, or government regulation, creating a leadership context with inaccurate, unavailable, or obsolete information (Eisenhardt & Bourgeois, 1988).

The modern airline industry has experienced a high velocity environment; airline organizational managers have faced new aviation technologies (larger size planes and more fuel efficient engines), fluctuating demand, larger firms, labor and fuel price shocks, and new government regulations (Iyer, 2005). Additionally, the microcomputer industry of the mid-1980s has operated in dynamic environments, where firm leaders have experienced substantial technological change, new computer architecture, more market competition, and double-digit growth in demand (Eisenhardt & Bourgeois, 1988). These examples reflect the pace of change in a dynamic environment and the predictability of the changes that occur (Cordery, Mueller, & Smith, 1991). Uncertainty, the degree to which future states of the environment cannot be anticipated and accurately predicted, challenges the forecasting capability of leaders and may inhibit decisions and actions (Pfeffer & Salancik, 1978). When leaders wait or fail to make decisions during increasing uncertainty, they enter a downward cycle: searching for data to confirm previous choices, discovering new environmental changes, and restarting the decision-making process (Eisenhardt, 1989). Extreme rate of change and uncertainty inherent to dynamic situations, where information contains questionable accuracy and quickly becomes obsolete, may reduce a leader's ability to make proactive decisions and achieve organizational objectives (Bourgeois & Eisenhardt, 1988).

Examining the characteristics of dangerous context through dynamism, discontinuous and rapid change, increasing uncertainty, and imperfect or obsolete information, coupled with the threat of physical or psychology injury or death, may present the ultimate psychological, social, and physical challenges for leaders (Sweeney et al., 2011). Individuals may likely view these types of environments, containing high

levels of dynamism, uncertainty, and danger, as extremely risky. The accumulative presence of extreme contextual elements induces high levels of stress and anxiety in leaders (Waldman, Ramirez, House, & Puranam, 2001; Sweeney et al., 2011).

Lin, Zhao, Ismail, and Carley (2006) and Seeger, Sellnow, and Ulmer (2003) have maintained dangerous settings contain crises with ambiguity, uncertainty, and unanticipated events. The classic example, a military organization, operates in dynamic settings demonstrating uncertainty, unpredictability, and danger (United States Marine Corps, 1997a). The inconsistent presence and rapidly changing rate of intensity for these variables impact military leaders' decision-making processes (United States Marine Corps, 1996). New technologies (laser-guided weapons, stealth, digital communications, satellite navigation, etc.), unconventional enemy forces, distributed operations, and strong, political control of warfare compress time and space, forcing higher operating tempos and creating a greater demand for timely, accurate information to achieve effective leadership performance (United States Marine Corps, 1996, 1997b). This form of context may potentially lead to disastrous or life-threatening errors on the parts of team members (Weick & Sutcliffe, 2007). As the velocity and danger of the environment increases, the potential hazards appear and are open to multiple, conflicting interpretations for team members (Baran & Scott, 2010). This increase in situational risk creates a greater need to both find new information quickly and to rapidly adapt to the changing situation in order to lead effectively (United States Marine Corps, 1996).

Social Power

Social power represents the potential to influence (Pfeffer, 2003; Yukl, 2010b). French and Raven's (1959) seminal work on social power produced a taxonomy of power

bases used by leaders to influence others in organizations. Focusing solely on downward directional influence (Raven, 1993), French and Raven (1959) argued the five primary bases for social power included: coercive, legitimate, reward, referent, and expert. Each base enables an agent to influence a target to perform in a manner in which the target may not otherwise perform (Raven, Schwarzwald, & Koslowsky, 1998). Coercive power enables agents to threaten punishment to achieve influence. Legitimate power focuses on an agent's hierarchical position to influence. Reward power achieves influence by promising compensation. Referent power relies on the target's identification with the agent. Finally, expert power achieves influence through the agent's high levels of knowledge. As the theory of social power evolved, new power bases appeared in the taxonomy. Informational power (Raven, 1999) enables agents to influence by withholding or providing valuable information.

In the power construct, the relationship between the target of influence and the agent of influence, determines the level of power (Pfeffer, 2003). Agents of influence attempt to exert power on targets through specific influence behaviors or influence tactics (Yukl, 2010b). Though power represents the potential to influence, influence tactics represent the action attempts of influence by agents onto targets (Raven et al., 1998). If agents lack power, they are limited in the number of available influence tactics to employ with targets (Falbe & Yukl, 1992). In this relationship, power acts as a moderator between influence tactics and outcomes, enhancing or diminishing influence behaviors due to its presence or lack of presence (Barbuto & Gifford, 2009). However, leaders may have great potential to influence by holding multiple bases of power, but may only choose to execute influence tactics for only one power base (Elias, 2006). Additionally,

varying combinations of tactics may enable agents to exhibit more influence than single tactics depending upon compatibility and context (Falbe & Yukl, 1992).

Social power represents an essential element of effective leadership and performance (Yukl & Falbe, 1990; Yukl, Seifert, & Chavez, 2008). Power enhances leaders' capacity to successfully employ appropriate influence tactics (Pfeffer, 2003). Additionally, effective leaders influence others via downward, lateral, and upward directions in order to achieve organizational objectives (Yukl & Falbe, 1990, 1991). In this regard, social power and influence represent key interrelated concepts in the field of management. However, management scholars and researchers have not integrated power and influence into leadership literature to their full potential (Elias, 2006).

Conceptual Model and Propositions

<Insert Figure 1 about here>

Shared Leadership, Team Performance, and SNA

Carson et al. (2007) have measured shared leadership using network density by asking each team member to rate each member of their team on the question, "To what degree does your team rely on this individual for leadership?" The scale ranged from 1 (*not at all*) to 5 (*to a very great extent*). Density is a measure of the average rating for all team members within the group. An average tie rating of 5 would indicate that all team members perceived all the other members of the team to rely on each other "to a very great extent" for leadership. Consequently, a tie strength of 5 would indicate high shared leadership.

However, density alone fails to capture the entire shared leadership model. The limitation with the density measure is that the average tie strength does not account for

the distribution of leadership. A measure of shared leadership must not only account for the level of leadership at the team level, but also the degree to which leadership is distributed amongst the members of the team (Conger & Pearce, 2003). Do all team members share in the responsibility of providing leadership or is it simply a few members of the team? The more leadership is distributed, the better equipped a team is to handle a dynamic, fast-paced environment because the leadership is not focused on a single, or a few, actors. Thus, network centralization should also be included in the measure of shared leadership (Gockel & Werth, 2010; Mayo et al., 2003).

<Insert Figure 2 about here>

For example, the two six-person networks in Figure 2 have an average tie strength (density) of 3. In other words, the teams possess a leadership strength of 3. The heads of the arrows point to team members nominated as demonstrating leadership within the group. In Figure 2a, only three team members were nominated as leaders, but each of those members received the highest possible rating (5), while the other team members received the lowest possible rating (1). In Figure 2b, all six team members were nominated as leaders; each team member received ratings of 3 from each of the other members on the team. Though the average tie strength for the two networks is the same, the distribution of leadership within the networks is very different.

<Insert Table 1 about here>

The distribution of leadership is not completely captured using density because density is not able to distinguish how the ties in the team are distributed. Centralization is a measure of distribution of ties in a network. A centralization value of 1 would indicate that one team member is regarded as the leader, and the team would be

completely centralized. In contrast, Figure 2b demonstrates a completely decentralized network, where the leadership is completely, evenly distributed, and is a better example of shared leadership. The centralization of the network depicted in Figure 2a is 48%, while the centralization of Figure 2b is 0 (see Table 1).

This discussion of using density as the sole measure of shared leadership should not be interpreted as an argument proposing the removal of density as an indicator of shared leadership. For example, using the scale from Carson et al. (2007), if all team members rate each other as “never” demonstrating leadership, the centralization is 0, indicating a completely decentralized network. However, the density of the network is 1, the lowest possible team leadership strength score. Thus, centralization alone is not able to completely capture shared leadership. Density and centralization should both be included as indicators of shared leadership (Gockel & Werth, 2010).

Proposition 1. Teams with relatively higher density and relatively higher decentralization (low centralization) shall also have relatively higher team performance.

Dangerous Environments as a Moderator

The need for team members to share leadership relates to new, complex demands of modern work situations, technology, and patterns of interdependence and coordination (Yammarino, Mumford, Connelly, & Dionne, 2010). Dynamism, discontinuous and rapid change, increasing uncertainty, imperfect or obsolete information, and the high risk of physical or psychological injury may induce stress at individual and team levels, impacting the outcome of various leadership and team processes (Hart & Cooper, 2002; Yukl, 2010a). Additionally, the downward spiral of reactive decision making by team leaders in dangerous contexts may also lead to negative outcomes (Cordery et al., 1991;

Eisenhardt & Bourgeois, 1988). As tasks congruent with the dangerous context increase in complexity (Meyerson, Weick, & Kramer, 1996), hierarchical team leaders may become overwhelmed and unable to effectively handle the situation on their own. In effect, the volatility in extreme contexts makes it impractical for a vertical leader to maintain hierarchical control of a team, leading to negative outcomes (Pearce & Conger, 2003; Yammarino et al., 2010). However, the process of shared leadership may enable teams to meet the challenges of and excel in dangerous contexts.

In extreme situations, team members identify with the team purpose and mission, becoming willing to make individual sacrifices for the team and to enhance other team members' potential and capabilities (Yammarino et al., 2010). Individuals other than the designated team leader may emerge in a serial fashion to provide influence and direct the team toward its common mission (Pearce & Conger, 2003; Pearce & Sims, 2002). By sharing leadership in dangerous environments, team members may more effectively utilize complementary KSAs to meet the demands of the situation, enabling them to effectively negotiate complex tasks (Cox, Pearce, & Perry, 2003; Klein, Ziegert, Knight, & Xiao, 2006; Pearce & Sims, 2002). In effect, increased task complexity requires increased shared leadership to achieve successful outcomes (Pearce & Sims, 2002). The elements driving dangerous contexts change the nature of group tasks from routine to challenging and complex. Working for a common goal, the group may dynamically share influence in order to meet the challenges and interconnected requirements of complex tasks rather than failing to act. However, under routine conditions lacking task complexity, shared leadership may represent an ineffective team process. Teams operating in routine situations, lacking a dangerous and dynamic context, may experience

process losses due to the diversion of effort and resources to group maintenance which “may be more profitably invested directly in completing relatively discrete, simple tasks” (Cox et al., 2003, p. 65). With little requirement for coordination or collaboration, shared leadership may represent an irrelevant option for teams in these situations, as it may contribute to a lack of effectiveness or even ineffectiveness.

Proposition 2: The level of danger in team operating environments moderates the relationship between shared leadership and team performance.

Social Power Distribution as a Moderator

A broad range of factors may encourage the demonstration or expression of shared leadership, to include members’ task competence, mental modes, and familiarity (Conger & Pearce, 2003). Additionally, individuals in teams emerge to influence and lead others through role differentiation and social interaction (Seers, Keller, & Wilkerson, 2003). It is unlikely for designated team leaders to possess all of the requisite KSAs to effectively accomplish diverse and complex tasks in multifunctional environments (Conger & Pearce, 2003). To combat these challenges, team members have demonstrated a dependence on shared mental models, knowledge, and compatibility (Burke, 1974; Gibson, 2001; Mohammed & Dumville, 2001; O’Toole, Galbraith, & Lawler, 2003). Shared knowledge and compatible structures may reduce variance in team performance, enhance team cohesiveness, form positive team climates, and promote the accomplishment of team objectives (Yammarino et al., 2010).

Many teams operating in dangerous environments are comprised of highly specialized individuals with complementary skills organized into functional groups (Hannah et al., 2010). Some members may have experienced dangerous environments in the past, enhancing their ability to lead in future situations (Fisher, Hutchings, & Sarros,

2010). Additionally, individuals with designated hierarchical roles within a team may possess the formal authority required to request additional resources and make related decisions. These are examples of varying bases for social power. Specialized individuals—with extensive skills, training, and experience in highly specialized roles—may possess high levels of expert power. Those individuals demonstrating socially acceptable and desirable behaviors may garner more respect from team members, demonstrating a high level of referent power. Team members with the authority to make significant resource decisions for the team hold high levels of legitimate power. Individuals possessing vital facts and logical justifications for dangerous situations may retain a high level of informational power. Finally, individuals with the ability to provide rewards or to coerce others during dangerous situations hold reward and coercive power bases.

Managers viewing power as a shared resource may be more likely to share power with others within a team (Coleman, 2004). Organizations have restructured and reorganized their work forces to support shared power in decentralized, self-managed teams (Cohen & Ledford, 1994). The distribution of power facilitates the sharing of tasks, consideration, and roles (Seers et al., 2003). The greater distribution of power among the team enables group members to influence others and share leadership. However, as power is concentrated within a single person or small number of individuals in relation to group size, the majority of the team experiences a power shortage. This may result in a smaller potential to influence others, resulting in a lack of shared leadership.

Proposition 3: The distribution of social power among a team moderates the relationship between shared leadership and team performance.

Discussion

Theoretical and Practical Implications

Answering the calls of multiple leadership scholars to address management conceptual exploration and empirical research in team and extreme contexts, the authors have developed a conceptual model of shared leadership in dangerous contexts, contributing to the advancement, study, and practice of management and leadership in three key areas. First, the introduction of an enhanced SNA measure of shared leadership may enable researchers to more effectively and accurately assess distribution and relational aspects of shared leadership in teams to predict performance. Second, this model, integrating multiple concepts from the field of study, potentially provides a viable framework to describe and enhance shared leadership within teams during dangerous situations. The inclusion of a dangerous environmental context as the moderating variable within the conceptual model enables researchers to consider the implications of shared leadership in previously unexplored contexts. Finally, the inclusion of social power distribution as a moderator within the model builds upon an area of management research requiring more inquiry and potentially enables scholars to improve their understanding concerning the importance of social power in teams. These combined efforts advance the field of study by presenting new bridges to multiple theoretical gaps in extreme context, team, and shared leadership research.

With regard to the practice of management and leadership in dangerous contexts, this model has the potential to further advance the field of study following empirical testing. As the employment of self-managed teams continues to increase (Houghton, Neck, & Manz, 2003; Manz & Sims, 1993), organizations with the potential of operating

in dangerous environments (military, police, firefighting, search and rescue, other government organizations, etc.) may find it more valuable to approach shared leadership as a complement to traditional team models. Unlike conventional contexts, where a lack of performance may negatively impact profits, market share, etc., the performance of teams in extreme contexts is truly a matter of life and death; the stimulation of research along this line of inquiry may have a profound impact on the leadership processes practiced by teams in the most extreme situations. Empirical testing of this model, focusing on the distribution of social power and leadership in teams, may also stimulate changes in the methods normally practiced to select and develop teams working in extreme contexts. Examples of this in practice may include greater role clarification and highly specialized training for team members, the selection of self-managed team members' social power capacity, and increasing requirements for practical, scenario-based shared leadership training for teams likely to operate in extreme contexts. This may enable organizations to execute previously ignored team distributed leadership practices in the most challenging situations.

Limitations

The primary focus of this model is on shared leadership in teams operating in extreme context; it does not significantly address other traditional approaches to team leadership, such as the solely hierarchical model. Measuring shared leadership using SNA may provide a relative scale of shared leadership in teams, but no absolute distinction of vertical leadership and shared leadership can yet be proposed. However, it is reasonable to assume the investigation of relative measures of vertical leadership and shared leadership in teams will yield additional findings more sufficiently enabling

scholars and practitioners to conceptually answer the question of when to share leadership in teams working in dangerous situations.

The conceptual model of shared leadership in dangerous contexts also neglects the comprehensive integration of other potential moderating variables, such as team size, varying dimensions of team diversity (age, sex, culture, etc.), and group member turnover (Conger & Pearce, 2003). Solely examining social power distribution and dangerous situations moderators for shared leadership and team performance may prevent the framework from determining the specific components and processes beyond these variables contributing to the display and use of shared leadership in extreme situations. To improve the model, it may be beneficial to include team size, cultural or demographic diversity, and member turnover as possible moderator or mediator variables rather than attempting to control these factors as nuisance variables during research.

The lack of a reliable measure for extreme environments represents a major challenge for examining leadership in dangerous contexts. In order to effectively measure dangerous context, researchers may need to develop a new measure incorporating items from other reliable instruments measuring environmental dynamism/change, uncertainty, risk, and danger from strategic management literature. Additionally, researchers may desire to conduct a qualitative study using ethnographic approaches with a specific sample (military, police, fire, rescue, etc.) in order to describe the elements of dangerous environments and construct a measure with items capturing dangerous environmental context.

Limited access to specialized teams with a high potential for operating regularly in dangerous contexts may present challenges to researchers attempting to empirically

test the conceptual model of shared leadership in dangerous environments. Though the development of team training scenarios may offer opportunities for pilot studies and laboratory and/or simulator testing, the value of the data may not be as high as that found in field studies. Researchers may have to provide survey instruments to team members immediately following events in dangerous contexts. Organizations, especially those with teams relying on clandestine operations or ongoing criminal investigations, may be reluctant to grant such field access. Researchers may need to conduct unconventional data control methods in these cases in order to secure permission to conduct field studies. SNA studies are sensitive to missing data, so researchers must be able to collect nearly complete data from the participants in order to conduct accurate analysis (Knoke & Yang, 2008). Furthermore, in order to collect social network data, respondents must assess each team member, which can increase respondent burden. This burden can be reduced by ensuring team size is relatively small, but team size must be a theoretically driven *a priori* decision by the researchers.

Recommendations

There exists a high potential for management researchers to conduct future empirical studies of this model to determine the boundaries of shared leadership and their impact on team performance. Scholars may find it useful to compare the performance relationships of teams using contrasting approaches to leadership (shared versus vertical) under varying conditions of dangerous context and social power distribution. This may provide insight into which influence process may be more effective under varying conditions, more appropriately answering the question of when to share leadership in teams. Additionally, researchers may find an opportunity to compare the social power

distribution and shared leadership scores between teams with high and low power distribution levels. This type of study may be able to determine which degree of social power distribution facilitated the highest degree of shared leadership for a given set of tasks or objectives in a dangerous context.

Finally, scholars may encounter institutional review board (IRB) and field research site challenges complicating the study of shared leadership in dangerous environments. The general mission of an IRB is to ensure research participants are not placed at undue risk, provide informed consent to their participation, and rights are protected during the conduct of studies. Proposing research in dangerous context, where an element of death or psychological injury exists, may prevent researchers from receiving permission to test models in extreme situations, as this may increase the risk of harm to participants. As a result, researchers must use balance when developing projects in order to simulate danger while at the same time protecting participants as well as ensuring proper medical and psychological care is available during and after the conclusion of studies. Researchers may accomplish this by conducting research projects in conjunction with dangerous training events regularly completed by samples operating in extreme context. For example, researchers may seek to integrate studies into military or law enforcement training programs conducting live fire team scenarios. This ensures the sample has regular experience in this dangerous training realm, providing less risk to participants and passing IRB standards for approval.

Conclusion

This conceptual model of shared leadership advances the field of study by proposing a more comprehensive measure of this emerging leadership phenomena and

exploring team leadership outside conventional contexts. By addressing the measurements and boundary conditions for shared leadership in teams, this scholarly effort also may stimulate future empirical studies investigating shared leadership in dangerous environments using SNA in order to bridge the current gaps in dangerous context, team, and team leadership research. The proposed SNA design, specifically using both measures of network density and centralization, provide a more holistic and theoretically sound assessment of shared leadership. The integration of extreme situations and social power distribution in teams as moderators may enable researchers and practitioners to more effectively understand when to share leadership in teams.

REFERENCES

- Aldrich, H. E. (1979). *Organizations and environments*. Englewood Cliffs, NJ: Prentice-Hall.
- Antonakis, J., Schriesheim, C., Donovan, J., Gopalakrishna-Pillai, K., Pellegrini, E., & Rossomme, J. (2004). Methods for studying leadership. In J. Antonakis, A. Cianciolo, & R. Sternberg (Eds.), *The nature of leadership* (pp. 48-70). Thousand Oaks, CA: Sage.
- Avolio, B., Jung, D., Murry, W., & Sivasubramaniam, N. (1996). Building highly developed teams: Focusing on shared leadership process, efficacy, trust, and performance. In M. Beyerlein, D. Johnson, & S. Beyerlein (Eds.), *Advances in interdisciplinary studies of work teams* (pp. 173-209). Greenwich, CT: JAI Press.
- Avolio, B., Sivasubramaniam, N., Murry, W., Jung, D., & Garger, J. (2003). Assessing shared leadership: Development and preliminary validation of a team multifactor leadership questionnaire. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 141-172). Thousand Oaks, CA: Sage.
- Baran, B., & Scott, C. (2010). Organizing ambiguity: A grounded theory of leadership and sensemaking within dangerous contexts. *Military Psychology*, 22(Suppl. 1), S242-S269.
- Barbuto, J. E., & Gifford, G. T. (2009). Influence triggers and compliance: A discussion of the effects of power, motivation, resistance, and antecedents. In D. Tjosvold & B. Wisse (Eds.), *Power and interdependence in organizations* (pp. 262-280). Cambridge, NY: Cambridge University Press.
- Bergman, J., Rentsch, J., Small, E., Davenport, S., & Bergman, S. (2012). The shared leadership process in decision-making teams. *Journal of Social Psychology*, 152(1), 17-42.
- Boe, O., Woolley, K., & Durkin, J. (2011). Choosing the elite: Recruitment, assessment, and selection of law enforcement tactical teams and military special forces. In P. Sweeney, M. Matthews, & P. Lester (Eds.), *Leadership in dangerous situations: A handbook for the armed forces, emergency services, and first responders* (pp. 333-349). Annapolis, MD: Naval Institute Press.
- Boies, K., Lvina, E., & Martens, M. (2010). Shared leadership and team performance in a business strategy simulation. *Journal of Personnel Psychology*, 9(4), 195-202.
- Borgatti, S., & Foster, P. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, 29(6), 991-1013.

- Bourgeois, L., III, & Eisenhardt, K. (1988). Strategic decision process in high velocity environments: Four cases in the microcomputer industry. *Management Science*, 34(7), 816-835.
- Burke, P. (1974). Participation and leadership in small groups. *American Sociological Review*, 39(6), 832-843.
- Campbell, D., Hannah, S., & Matthews, M. (2010). Leadership in military and other dangerous contexts: Introduction to the special topic issue. *Military Psychology*, 22(Suppl. 1), S1-S14.
- Carson, J., Tesluk, P., & Marrone, J. (2007). Shared leadership in teams: An investigation of antecedent conditions and performance. *Academy of Management Journal*, 50(5), 1217-1234.
- Cohen, S., & Ledford, G. (1994). The effectiveness of self-managing teams: A quasi-experiment. *Human Relations*, 47, 13-43.
- Coleman, P. (2004). Implicit theories of organizational power and priming effects on managerial power-sharing decisions: An experimental study. *Journal of Applied Social Psychology*, 34(2), 297-321.
- Conger, J., & Kanungo, R. (1998). *Charismatic leadership in organizations*. Thousand Oaks, CA: Sage Publishers.
- Conger, J., & Pearce, C. (2003). A landscape of opportunities: Future research on shared leadership. In C. L. Pearce & J. A. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 285-303). Thousand Oaks, CA: Sage Publications.
- Cordery, J., Mueller, W., & Smith, L. (1991). Attitudinal and behavior effects of autonomous group working: A longitudinal field study. *Academy of Management Journal*, 34(2), 464-476.
- Cox, J., Pearce, C., & Perry, M. (2003). Toward a model of shared leadership and distributed influence in the innovation process: How shared leadership can enhance new product development team dynamics and effectiveness. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 48-76). Thousand Oaks, CA: Sage.
- Day, D., Gronn, P., & Salas, E. (2004). Leadership capacity in teams. *The Leadership Quarterly*, 15(6), 857-880.
- Day, D., Gronn, P., & Salas, E. (2006). Leadership in team-based organizations: On the threshold of a new era. *The Leadership Quarterly*, 17(3), 211-216.

- DeCelles, K., & Pfarrer, M. (2004). Heroes or villains? Corruption and the charismatic leader. *Journal of Leadership & Organizational Studies*, 11(1), 67-77.
- Dess, G., & Beard, D. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly*, 29(1), 52-73.
- Dool, R. (2010). Lessons from the military: A new framework for managing change (C5). *Journal of Leadership & Organizational Studies*, 17(3), 253-263.
- Dubin, R. (1976). Theory building in applied areas. In M. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 17-39). Chicago, IL: Rand McNally.
- Dunphy, D. (2000). Embracing paradox: Top-down versus participative management of organizational change. In M. Beer & N. Nohria (Eds.), *Breaking the code of change* (pp. 123-136). Boston, MA: Harvard Business School Press.
- Eisenhardt, K. (1989). Making fast strategic decisions in high velocity environments. *Academy of Management Journal*, 32(3), 543-576.
- Eisenhardt, K., & Bourgeois, L., III. (1988). Politics of strategic decision making in high velocity environments: Toward a midrange theory. *Academy of Management Journal*, 31(4), 737-770.
- Elias, S. (2006). Fifty years of influence in the workplace: The evolution of the French and Raven power taxonomy. *Journal of Management History*, 14(3), 267-283.
- Ensley, M., Hmieleski, K., & Pearce, C. (2006). The importance of vertical and shared leadership within new venture top management teams: Implications for the performance of startups. *The Leadership Quarterly*, 17(3), 217-231.
- Ensley, M., Pearce, C., & Hmieleski, K. (2006). The moderating effect of environmental dynamism on the relationship between entrepreneur leadership behavior and new venture performance. *Journal of Business Venturing*, 21(2), 243-263.
- Falbe, C., & Yukl, G. (1992). Consequences for managers of using single influence tactics and combinations of tactics. *Academy of Management Journal*, 35(3), 638-652.
- Fisher, K., Hutchings, K., & Sarros, J. (2010). The “bright” and “shadow” aspects of in extremis leadership. *Military Psychology*, 22(Suppl. 1), S89-S116.
- French, J., & Raven, B. (1959). The bases of social power. In D. Cartwright & A. Zander (Eds.), *Group dynamics* (pp. 150-167). New York, NY: Harper & Row.

- Gibson, C. (2001). From knowledge accumulation to accommodation: Cycles of collective cognition in work groups. *Journal of Organizational Behavior*, 22(2), 145-160.
- Gockel, C., & Werth, L. (2010). Measuring and modeling shared leadership: Traditional approaches and new ideas. *Journal of Personnel Psychology*, 9(4), 172-180.
- Gronn, P. (2000). Distributed properties: A new architecture for leadership. *Educational Management and Administration*, 28, 317-338.
- Gronn, P. (2002). Distributed leadership as a unit of analysis. *The Leadership Quarterly*, 13, 423-451.
- Gundersen, G., Hellesøy, B., & Raeder, S. (2012). Leading international project teams: The effectiveness of transformational leadership in dynamic work environments. *Journal of Leadership & Organizational Studies*, 19(1), 46-57.
- Hannah, S., Campbell, D., & Matthews, M. (2010). Advancing a research agenda for leadership in dangerous contexts. *Military Psychology*, 22(Suppl. 1), S157-S189.
- Hannah, S., Uhl-Bien, M., Avolio, B., & Cavarretta, F. (2009). A framework for examining leadership in extreme contexts. *The Leadership Quarterly*, 20(6), 897-919.
- Harms, P., Han, G., & Chen, H. (2012). Recognizing leadership at a distance. *Journal of Leadership & Organizational Studies*, 19(2), 164-172.
- Hart, P., & Cooper, C. (2002). Occupational stress: Toward a more integrated framework. In N. Anderson, D. Ones, H. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work, and organizational psychology* (Vol. 2, pp. 93-114). London: Sage.
- Henderson, A., & Stern, I. (2004). Selection-based learning: The coevolution of internal and external selection in high velocity environments. *Administrative Science Quarterly*, 49(1), 39-75.
- Hoch, J., Pearce, C., & Welzel, L. (2010). Is the most effective team leadership shared? The impact of shared leadership, age diversity, and coordination on team performance. *Journal of Personnel Psychology*, 9(3), 105-116.
- Hofstede, G., Hofstede, G., & Minkov, M. (2010). *Culture and organizations: Software of the mind* (3rd ed.). New York, NY: McGraw-Hill.
- Hoppe, B., & Reinelt, C. (2010). Social network analysis and the evaluation of leadership networks. *The Leadership Quarterly*, 21, 600-619.

- Houghton, J., Neck, C., & Manz, C. (2003). Self-leadership and superleadership: The heart and art of creating shared leadership in teams. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 123-140). Thousand Oaks, CA: Sage.
- Hunt, J. (1999). Transformational/charismatic leadership's transformation of the field: An historical essay. *The Leadership Quarterly*, 10(2), 129-144.
- Iyer, S. (2005). Airline companies see glimmer of hope. *High Yield Report*, 16(48), 1-11.
- Johnson, C. (2008). The rise and fall of Carly Fiorina: An ethical case study. *Journal of Leadership & Organizational Studies*, 15(2), 188-196.
- Khasawneh, S. (2011). Shared leadership and organizational citizenship behaviour in Jordanian public universities: Developing a global workforce for the 21st century. *Educational Management Administration & Leadership*, 39(5), 621-634.
- Klein, K., Ziegert, J., Knight, A., & Xiao, Y. (2006). Dynamic delegation: Shared, hierarchical, and deindividualized leadership in extreme action teams. *Administrative Science Quarterly*, 51(4), 590-621.
- Knoke, D., & Yang, S. (2008). *Social network analysis: Quantitative applications in the social sciences*. Thousand Oaks, CA: Sage Publications.
- Kolditz, T. (2007). *In extremis leadership: Leading as if your life depended on it*. San Francisco: Jossey-Bass.
- Kozlowski, S., & Bell, B. (2003). Work groups and teams in organizations. In W. C. Borman, D. Ilgen, & R. Klimoski (Eds.), *Comprehensive handbook of psychology: Industrial and organizational psychology* (pp. 333-375). New York, NY: John Wiley.
- Lin, Z., Zhao, X., Ismail, K., & Carley, K. (2006). Organizational design and restructuring in response to crises: Lessons from computational modeling and real-world cases. *Organization Science*, 17(5), 598-618.
- Manz, C., Manz, K., Adams, S., & Shipper, F. (2010). A model of values-based shared leadership and sustainable performance. *Journal of Personnel Psychology*, 9(4), 212-217.
- Manz, C., Pearce, C., & Sims, H. (2009). The ins and outs of leading teams: An overview. *Organizational Dynamics*, 38(3), 179-182.
- Manz, C., & Sims, H. (1987). Leading workers to lead themselves: The external leadership of self-managing work teams. *Administrative Science Quarterly*, 32(1), 106-128.

- Manz, C., & Sims, H. (1993). *Business without bosses: How self-managing teams are building high-performing companies*. New York, NY: John Wiley and Sons.
- Manz, C., & Sims, H. (2001). *The new superleadership: Leading others to lead themselves*. San Francisco, CA: Berrett-Koehler.
- Matkin, G., & Barbuto, J. (2012). Demographic similarity/difference, intercultural sensitivity, and leader-member exchange. *Journal of Leadership & Organizational Studies*, 19(3), 294-302.
- Mayo, M., Meindl, J. R., & Pastor, J.-C. (2003). Shared leadership in work teams. In C. L. Pearce & J. A. Conger (Eds.), *Shared leadership: Reframing the how and whys of leadership* (pp. 193-214). Thousand Oaks, CA: Sage.
- Mehra, A., Smith, B. R., Dixon, A. L., & Robertson, B. (2006). Distributed leadership in teams: The network of leadership perceptions and team performance. *The Leadership Quarterly*, 17(3), 232-245.
- Meyerson, D., Weick, K., & Kramer, R. (1996). Swift trust in temporary groups. In R. Kramer & T. Tyler (Eds.), *Trust in organizations: Frontiers of theory and research* (pp. 165-195). Thousand Oaks, CA: Sage.
- Millikin, J., Horn, P., & Manz, C. (2010). Self-management competencies in self-managing teams: Their impact on multi-team system productivity. *The Leadership Quarterly*, 21(5), 687-702.
- Mills, K. (2011). Shared leadership. *Brw*, 33(23), 26-27.
- Mohammed, S., & Dumville, B. (2001). Team mental models in a team knowledge framework: Expanding theory and measurement across disciplinary boundaries. *Journal of Organizational Behavior*, 22(2), 89-106.
- Muczyk, J., & Holt, D. (2008). Toward a cultural contingency model of leadership. *Journal of Leadership & Organizational Studies*, 14(4), 277-286.
- O'Toole, J., Galbraith, J., & Lawler, E. (2003). The promise and pitfalls of shared leadership: When two (or more) heads are better than one. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 250-264). Thousand Oaks, CA: Sage.
- Pearce, C. (1997). *The determinants of change management team (CMT) effectiveness: A longitudinal investigation* (Unpublished doctoral dissertation). University of Maryland, College Park.

- Pearce, C. (2004). The future of leadership: Combining vertical and shared leadership to transform knowledge work. *Academy of Management Executive*, 18(1), 47-57.
- Pearce, C., & Conger, J. (Eds.). (2003). *Shared leadership: Reframing the hows and whys of leadership*. Thousand Oaks, CA: Sage Publications.
- Pearce, C., Conger, J., & Locke, E. (2008). Shared leadership theory. *The Leadership Quarterly*, 19(5), 622-628.
- Pearce, C., Hoch, J., Jeppesen, H., & Wegge, J. (2010). New forms of management: Shared and distributed leadership in organizations. *Journal of Personnel Psychology*, 9(4), 151-153.
- Pearce, C., Manz, C., & Sims, H. (2008). The roles of vertical and shared leadership in the enactment of executive corruption: Implications for research and practice. *The Leadership Quarterly*, 19(3), 353-359.
- Pearce, C., Manz, C., & Sims, H. (2009). Where do we go from here?: Is shared leadership the key to team success? *Organizational Dynamics*, 38(3), 234-238.
- Pearce, C., & Sims, H. (2002). Vertical versus shared leadership as predictors of the effectiveness of change management teams: An examination of aversive, directive, transactional, transformational, and empowering leader behaviors. *Group Dynamics: Theory, Research, and Practice*, 6(2), 172-197.
- Pearce, C., Yoo, Y., & Alavi, M. (2004). Leadership, social work, and virtual teams: The relative influence of vertical versus shared leadership in the nonprofit sector. In R. Riggio & S. Smith Orr (Eds.), *Improving leadership in nonprofit organizations* (pp. 160-203). San Francisco, CA: Jossey-Bass.
- Perry, M., Pearce, C., & Sims, H. (1999). Empowered selling teams: How shared leadership can contribute to selling team outcomes. *Journal of Personal Selling & Sales Management*, 19(3), 35-51.
- Pfeffer, J. (2003). Influence, power, and politics in organizational settings. In L. Porter, H. Angle, & R. Allen (Eds.), *Organizational influence processes* (pp. 3-13). New York, NY: M. E. Sharpe, Inc.
- Pfeffer, J., & Salancik, G. (1978). *The external control of organizations: A resource dependence perspective*. New York, NY: Harper & Row.
- Ramthun, A., & Matkin, G. (2012). Multicultural shared leadership: A conceptual model of shared leadership in culturally diverse teams. *Journal of Leadership & Organizational Studies*, 19(3), 303-314.

- Raven, B. (1993). The bases of power: Origins and recent developments. *Journal of Social Issues*, 49(4), 227-251.
- Raven, B. (1999). Kurt Lewin address: Influence, power, religion, and the mechanics of social control. *Journal of Social Issues*, 55, 161-186.
- Raven, B., Schwarzwald, J., & Koslowsky, M. (1998). Conceptualizing and measuring a power/interaction model of interpersonal influence. *Journal of Applied Social Psychology*, 28(4), 307-332.
- Reichers, A., & Schneider, B. (1990). Climate and culture: An evolution of constructs. In D. Schneider (Ed.), *Organizational climate and culture* (pp. 5-39). San Francisco, CA: Jossey-Bass.
- Scott, J. (2000). *Social network analysis: A handbook*. Los Angeles, CA: Sage
- Seeger, M., Sellnow, T., & Ulmer, R. (2003). *Communication and organizational crisis*. Westport, CT: Praeger.
- Seers, A., Keller, T., & Wilkerson, J. M. (2003). Can team members share leadership?: Foundations in research and theory. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 77-102). Thousand Oaks, CA: Sage Publications.
- Shamir, B., & Lapidot, Y. (2003). Shared leadership in the management of group boundaries. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 235-249). Thousand Oaks, CA: Sage Publications.
- Sivasubramaniam, N., Murry, W., Avolio, B., & Jung, D. (2002). A longitudinal model of the effect of team leadership and group potency on group performance. *Group & Organization Management*, 27(1), 66-96.
- Small, E., & Rentsch, J. (2010). Shared leadership in teams: A matter of distribution. *Journal of Personnel Psychology*, 9(4), 203.
- Solansky, S. (2008). Leadership style and team processes in self-managed teams. *Journal of Leadership & Organizational Studies*, 14(4), 332-341.
- Steinheider, B., & Wuestewald, T. (2008). From the bottom-up: Sharing leadership in a police agency. *Police Practice & Research*, 9(2), 145-163.
- Story, J., & Barbuto, J. (2011). Global mindset: A construct clarification and framework. *Journal of Leadership & Organizational Studies*, 18(3), 377-384.

- Sweeney, P., Matthews, M., & Lester, P. (Eds.) (2011). *Leadership in dangerous situations: A handbook for the armed forces, emergency services, and first responders*. Annapolis, MD: Naval Institute Press.
- Sweetman, D. (2010). *Exploring the adaptive function in complexity leadership theory: An examination of shared leadership and collective creativity in innovation networks* (Doctoral dissertation). Retrieved from <http://library.unl.edu>
- Uhl-Bien, M., & Marion, R. (Eds.) (2008). *Complexity leadership: Conceptual foundations*. Charlotte, NC: Information Age Publishing.
- Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly*, 18(4), 298-318.
- United States Marine Corps. (1996). *Command and control*. Retrieved from http://www.dtic.mil/doctrine/jel/service_pubs/mcdp6.pdf
- United States Marine Corps. (1997a). *Tactics*. Retrieved from <http://www.usmc.mil/news/publications/Documents/MCDP%201-3%20Tactics.pdf>
- United States Marine Corps. (1997b). *Warfighting*. Retrieved from http://www.dtic.mil/doctrine/jel/service_pubs/mcdp1.pdf
- Waldman, D., Ramirez, G., House, R., & Puranam, P. (2001). Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty. *Academy of Management Journal*, 44(1), 134-143.
- Weick, K., & Sutcliffe, K. (2007). *Managing the unexpected: Resilient performance in an age of uncertainty*. San Francisco, CA: Jossey-Bass.
- Yammarino, F., Mumford, M., Connelly, M., & Dionne, S. (2010). Leadership and team dynamics for dangerous military contexts. *Military Psychology*, 22(Suppl. 1), S15-S41.
- Yukl, G. (2010a). *Leadership in organizations* (7th ed.). Upper Saddle River, NJ: Prentice Hall.
- Yukl, G. (2010b). Power and the interpersonal influence of leaders. In D. Tjosvold & B. Wisse (Eds.), *Power and interdependence in organizations* (pp. 207-223). New York, NY: Cambridge.
- Yukl, G., & Falbe, C. (1990). Influence tactics and objectives in upward, downward, and lateral influence attempts. *Journal of Applied Psychology*, 75(2), 132-140.

- Yukl, G., & Falbe, C. (1991). Importance of different power sources in downward and lateral relations. *Journal of Applied Psychology*, 76(3), 416-423.
- Yukl, G., Seifert, C., & Chavez, C. (2008). Validation of the extended Influence Behavior Questionnaire. *The Leadership Quarterly*, 19(5), 609-621.

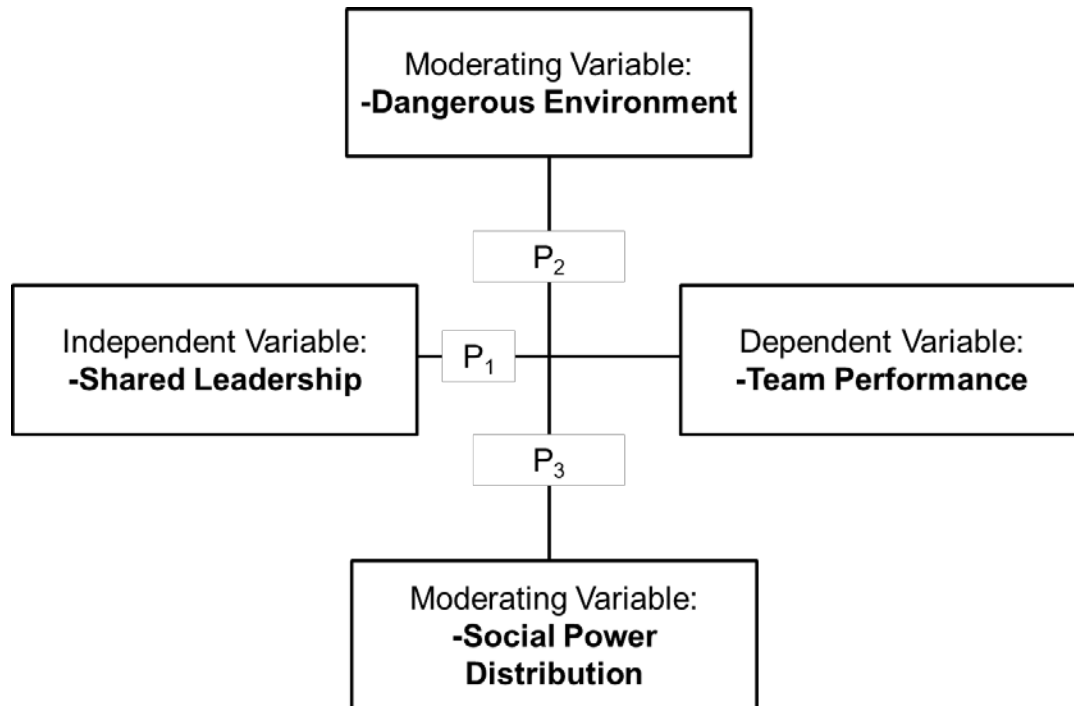


Figure 1. Visual depiction of the propositions forming a conceptual model of shared leadership in dangerous environments.

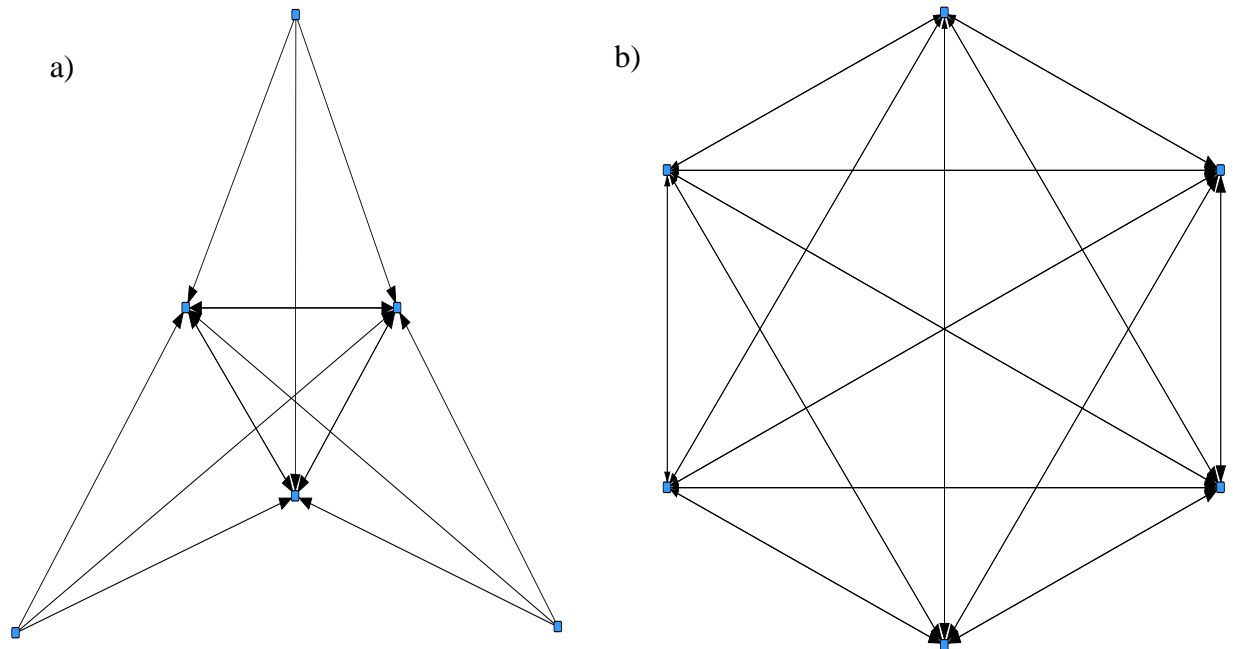


Figure 2. a) High centralization is depicted on the left (only 3 nodes were nominated as leaders). b) Complete decentralization (no centralization) is depicted on the right (all nodes were equally nominated as leaders).

Table 1

Centralized and decentralized networks and measures of density and centralization

	Density	Centralization (Indegree)
Centralized Network	3	48.00%
Decentralized Network	3	0

Note. Indegree refers to nominations received.

CHAPTER III:

Article 2

Living Dangerously: Shared Leadership and Performance

for Teams in Dangerous Environments

A. J. Ramthun, L. J. McElravy, and Gina S. Matkin

University of Nebraska-Lincoln

Department of Agricultural Leadership, Education, and Communication

Manuscript submitted for the

Academy of Management Annual Meeting 2013

Abstract

In a field study, we examined the influence of shared leadership on team performance for 51 military combat teams in a simulated dangerous environment. To simulate the dangerous context, we conducted the study at a tactical urban fighting complex utilizing paintball weapons, role players, and a dynamic combat scenario. Using social network analysis techniques and after controlling for team diversity and combat experience, we found the density measure of shared leadership to be positively and significantly related to team performance, accounting for 40% of the variance in team performance. We also found both the centralization measure and density/centralization interaction effect to be insignificantly related to team performance. A stepwise multiple regression analysis found the density measure of shared leadership and the control variable of team combat experience as the best predictors of team performance, significantly accounting for 49% of the variance in team performance. Implication, limits, and recommendations are discussed.

Keywords: shared leadership, teams, dangerous context

Living Dangerously: Shared Leadership and Performance for Teams in Dangerous Environments

To prevail while negotiating modern obstacles to performance (globalization, complexity, environmental dynamism, etc.), organizations have begun to transform from primarily top-down or centralized command and control structures (Dunphy, 2000; Pearce, Manz, & Sims, 2009) into self-managed teams (Manz & Sims, 1987, 1993, 2001; Millikin, Horn, & Manz, 2010; Solansky, 2008). These teams, rather than using rigid hierarchies of leadership to solely direct work efforts and meet objectives (Kozlowski & Bell, 2003), rely on one another, as team members, to exhibit leadership when appropriate based on their knowledge, skills, abilities, experience, and the situation (Pearce, 2004; Pearce et al., 2009). This team— multidirectional—influence approach is called shared leadership: a dynamic, interactive, social influence process among individuals in teams where members lead one another to achieve common objectives (Pearce & Conger, 2003). A relatively new concept in the field of management, shared leadership has seen increasing legitimization and confirmation in management literature (Pearce, Hoch, Jeppesen, & Wegge, 2010). As with the development of leadership theories in the field of management, the maturation of shared leadership requires new investigations of more accurate measures of the phenomena (Conger & Pearce, 2003) and boundary conditions (Antonakis et al., 2004) to further contribute to the study and practice of leadership (Hunt, 1999).

Gockel and Werth (2010) and Conger and Pearce (2003) have called on scholars to address the issue of accurately measuring shared leadership. A majority of quantitative shared leadership research has employed varying types of conventional survey scales

aggregating group members' assessments concerning the amount of shared influence and specific influence tactics in teams as a whole (Gockel & Werth, 2010), such as the shared leadership questionnaire (Pearce & Sims, 2002). However, it remains unclear how each member contributes to the leadership of the team or how the distribution of leadership is actually assessed using these methods (Gockel & Werth, 2010). One approach to provide greater clarity to overcome these scaling limitations may be the use of social network analysis (SNA). Some researchers have scaled shared leadership using SNA approaches (Carson, Tesluk, & Marrone, 2007; Small & Rentsch, 2010); however, the distribution of leadership throughout a network requires more attention (Mayo, Meindl, & Pastor, 2003).

Management scholars also have opportunities to advance the field's comprehension of shared leadership's boundary conditions, the circumstances under which the predictions of the theory hold (Dubin, 1976), by answering the calls of multiple researchers to investigate hybrid forms of group/team leadership models in varying contexts (Day, Gronn, & Salas, 2004, 2006; Pearce & Conger, 2003; Pearce et al., 2010). As the current body of shared leadership studies has focused on conventional contexts (Carson et al., 2007; Pearce, Yoo, & Alavi, 2004; Small & Rentsch, 2010), little research has examined shared influence within extreme or dangerous environments (Mills, 2011), where teams routinely face highly dynamic and unpredictable environments with the outcomes of leadership possibly resulting in severe physical or psychological injury (Campbell, Hannah, & Matthews, 2010; Sweeney, Matthews, & Lester, 2011). Organizations—such as military (special forces, aircrew, embedded training teams, provincial reconstruction teams, etc.), emergency services (firefighting, search and rescue, emergency medical teams, disaster response teams, etc.), law enforcement (task

forces, special weapons and tactics teams, hostage rescue teams, etc.), intelligence services (direct action teams, etc.), and aviation (airlines, cargo, corporate, private, rescue, military, etc.)—regularly employ teams in dangerous environments (Boe, Woolley, & Durkin, 2011; Campbell et al., 2010; Kolditz, 2007). However, the relationship between the presence of increasing levels of danger, shared leadership, and team performance remains unclear. These unresolved measurement issues and boundary conditions represent gaps in present phases of extreme contextual, team, shared leadership, and performance-related theory and research.

This present investigation of shared leadership has three primary purposes. First, to advance the management discipline's understanding of both shared leadership and extreme context by conducting an empirical field study using teams operating in a simulated dangerous environment. Second, further the leadership field's methodological comprehension of the measurement techniques regarding shared leadership. Specifically, we are testing the network-based measures of density, centralization, and the interaction of both density and centralization to effectively capture shared leadership within teams operating in dangerous environments. Finally, contribute to the growing body of shared influence research by confirming and extending previous studies focusing on shared leadership's relationship to team performance in extreme situations. To meet these scholarly objectives, we first review the theoretical foundations of shared leadership, SNA, dangerous environments, and develop testable hypotheses. Next, we discuss our study in detail, to include methodology, analyses, and results. We conclude our article with a discussion of the theoretical and practical implications, limitations, and recommendations for future directions of research.

Literature Review

Shared Leadership

Pearce and Conger (2003) have defined shared leadership as a “dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both” (p. 1). Management researchers view shared leadership as an emergent team property (Pearce & Sims, 2002), resulting from the distribution of leadership influence across multiple team members (Carson et al., 2007). Unlike traditional models of vertical leadership—the process of centralizing power and influence through a hierarchical leader (Pearce et al., 2009)—shared leadership uses the decentralization and sharing of power and influence among team members to achieve effectiveness (Pearce, Conger, & Locke, 2008). In teams characterized by vertical leadership, the organization’s structure may represent the primary contributing factor to the influence process (Conger & Kanungo, 1998); however, when leadership is shared, the influence process may emerge due to situational factors (Pearce & Conger, 2003; Pearce et al., 2009). As a result, shared leadership may act as a complement to vertical leadership when structure fails to achieve leadership effectiveness (Pearce, Manz, et al., 2008).

Shared leadership, supporting mutual influence rooted in the social interactions among group members, significantly improves team and organizational performance (Avolio, Jung, Murry, & Sivasubramaniam, 1996; Bergman, Rentsch, Small, Davenport, & Bergman, 2012; Carson et al., 2007; Day et al., 2004; Ensley, Pearce, & Hmieleski, 2006; Khasawneh, 2011; Pearce, 1997; Pearce & Sims, 2002; Pearce et al., 2004; Perry, Pearce, & Sims, 1999; Shamir & Lapidot, 2003). Additionally, investigations of shared

leadership have found significant links to other positive outcomes, such as team potency and trust (Boies, Lvina, & Martens, 2010) and sustainability (Manz, Manz, Adams, & Shipper, 2010). However, shared leadership may not be effective in every situation or act as a sole replacement to vertical leadership (Pearce & Conger, 2003). Followers lacking situational knowledge, skills, and abilities (KSA) may not be able to effectively contribute to the shared leadership process (Conger & Pearce, 2003).

Social Network Analysis

The primary quantitative methods for measuring shared leadership include evaluating the team as a whole (Avolio et al., 1996; Pearce & Sims, 2002; Sivasubramaniam, Murry, Avolio, & Jung, 2002) or as a social network (Carson et al., 2007; Mayo et al., 2003; Mehra, Smith, Dixon, & Robertson, 2006). Researchers measuring shared leadership asking respondents, via surveys, to rate the leadership behaviors of their team as a whole assume the respondents can mentally aggregate the contribution of leadership from all team members; scholars then use the mean responses of the individuals on the team to make interpretations concerning shared leadership (Avolio, Sivasubramaniam, Murry, Jung, & Garger, 2003). Though this method reduces the burden on respondents, it fails to measure the distribution, concentration, and relational patterns of leadership in the team (Carson et al., 2007; Mayo et al., 2003). Furthermore, it remains unclear how each member arrives at their team rating. Gockel and Werth (2010) ask several questions highlighting the problem with using team members' perceptions of team leadership: "Who is the reference? Do they average all team members' behaviors? Or do they base their judgments on the behavior of the most visible, influential, or sympathetic team member?" (p. 174).

In order to demonstrate that shared leadership as opposed to a single leader or a few leaders are solely responsible for creating a team environment leading to positive team outcomes, shared leadership may be measured using SNA (Mayo et al., 2003). Gockel and Werth (2010) conducted a review of shared leadership measuring techniques and suggested SNA may be used when researchers have interest in studying team level outcomes due to SNA's ability to account for the multidirectional and relational ties for a team. Since the 1980s, SNA has seen extensive use in the field of management and organizational studies (for a review, see Borgatti & Foster, 2003). As a methodological tool, SNA enables researchers to understand the relational ties in a network and consists of three main elements—the network, the nodes, and the relational ties (Scott, 2000). The field of leadership has recently begun to more heavily invest in SNA as a methodological tool (Hoppe & Reinelt, 2010). More specifically, Yukl (2010) suggests the literature from social network theory can be used to provide insight into shared leadership. SNA may not only be used to measure the degree to which team members perceive their team's shared leadership—network density—but SNA may also be used to explore how that leadership is distributed—centralization (Mehra et al., 2006; Small & Rentsch, 2010).

Only a small number of studies have explored shared leadership using SNA. Mehra et al. (2006) used qualitative coding of social network diagrams to explore the relationship between shared leadership and team performance. The quantitative methods of analyzing social networks are much more accessible to researchers through the use of computer programs (e.g., UCINET) and provide a much more rigorous and thorough examination of social network data. Carson et al. (2007) calculated network density as a

measure of shared leadership; whereas, Small and Rentsch (2010) focused on network centralization—the distribution of leadership—to measure shared leadership. However, researchers suggest network density and centralization should be combined to measure shared leadership using SNA (Gockel & Werth, 2010; Mayo et al., 2003).

Dangerous Environmental Context

Campbell et al. (2010) have narrowly classified dangerous environments as “those in which leaders or their followers are personally faced with highly dynamic and unpredictable situations and where the outcomes of leadership may result in severe physical or psychological injury (or death) to unit members” (p. S3). Environmental dynamism represents the heart of extreme contexts (Sweeney et al., 2011), where leaders find it difficult to predict change and face increasing uncertainty (Dess & Beard, 1984). Aldrich (1979) has argued the nature of environmental dynamism embodies turbulent, fluctuating changes in stability and instability. In dynamic settings, leaders discover this type of change to be obscure and difficult to plan against. Organizations operating in dynamic environments may experience sharp, rapid, and discontinuous change in demand, competitors, technology, or government regulation, creating a leadership context with inaccurate, unavailable, or obsolete information (Eisenhardt & Bourgeois, 1988).

Uncertainty, the degree to which future states of the environment cannot be anticipated and accurately predicted, challenges the forecasting capability of leaders and may inhibit decisions and actions (Pfeffer & Salancik, 1978). When leaders wait or fail to make decisions during increasing uncertainty, they enter a downward cycle: searching for data to confirm previous choices, discovering new environmental changes, and restarting the decision-making process (Eisenhardt, 1989). Extreme rate of change and

uncertainty inherent to dynamic situations, where information contains questionable accuracy and quickly becomes obsolete, may reduce a leader's ability to make proactive decisions and achieve organizational objectives (Bourgeois & Eisenhardt, 1988).

Examining the characteristics of dangerous context through dynamism, discontinuous and rapid change, increasing uncertainty, and imperfect or obsolete information, coupled with the threat of physical or psychological injury or death, may present the ultimate psychological, social, and physical challenges for leaders (Sweeney et al., 2011). Individuals may likely view these types of environments—containing high levels of dynamism, uncertainty, and danger—as extremely risky. The accumulative presence of extreme contextual elements induces high levels of stress and anxiety in leaders (Waldman, Ramirez, House, & Puranam, 2001; Sweeney et al., 2011).

Lin, Zhao, Ismail, and Carley (2006) and Seeger, Sellnow, and Ulmer (2003) have maintained dangerous settings contain crises with ambiguity, uncertainty, and unanticipated events. The classic example, a military organization, operates in dynamic settings demonstrating uncertainty, unpredictability, and danger (United States Marine Corps, 1997a). The inconsistent presence and rapidly changing rate of intensity for these variables impact military leaders' decision-making processes (United States Marine Corps, 1996). New technologies (laser-guided weapons, stealth, digital communications, satellite navigation, etc.), unconventional enemy forces, distributed operations, and strong, political control of warfare compress time and space, forcing higher operating tempos and creating a greater demand for timely, accurate information to achieve effective leadership performance (United States Marine Corps, 1996, 1997b).

This form of context may potentially lead to disastrous or life-threatening errors on the parts of team members (Weick & Sutcliffe, 2007). As the velocity and danger of the environment increases, the potential hazards appear and are open to multiple, conflicting interpretations for team members (Baran & Scott, 2010). This increase in situational risk creates a greater need to both find new information quickly and to rapidly adapt to the changing situation in order to lead effectively (United States Marine Corps, 1996). To meet these types of challenges on the team level, the United States (US) military has developed and employed self-managed, Special Forces operating teams. With diverse skill sets and highly specialized training, these teams act as complex adaptive systems in dangerous environments (Lindsay, Day, & Halpin, 2011). Their cross-functional nature and high reliability training enables individuals within the team to effectively adapt to a given situation and make meaning quickly to take decisive action.

Hypotheses

The need for team members to share leadership relates to new, complex demands of modern work situations, technology, and patterns of interdependence and coordination (Yammarino, Mumford, Connelly, & Dionne, 2010). Dynamism, discontinuous and rapid change, increasing uncertainty, imperfect or obsolete information, and the high risk of physical or psychological injury may induce stress at individual and team levels, impacting the outcome of various leadership and team processes (Hart & Cooper, 2002; Yukl, 2010). Additionally, the downward spiral of reactive decision making by team leaders in dangerous contexts may also lead to negative outcomes (Cordery, Mueller, & Smith, 1991; Eisenhardt & Bourgeois, 1988). As tasks congruent with the dangerous context increase in complexity (Meyerson, Weick, & Kramer, 1996), hierarchical team

leaders may become overwhelmed and unable to effectively handle the situation on their own. In effect, the volatility in extreme contexts makes it impractical for a vertical leader to maintain hierarchical control of a team, leading to negative outcomes (Pearce & Conger, 2003; Yammarino et al., 2010). However, the process of shared leadership may enable teams to meet the challenges of and excel in dangerous contexts.

In extreme situations, team members identify with the team purpose and mission, becoming willing to make individual sacrifices for the team and to enhance other team members' potential and capabilities (Yammarino et al., 2010). Individuals other than the designated team leader may emerge in a serial fashion to provide influence and direct the team toward its common mission (Pearce & Conger, 2003; Pearce & Sims, 2002). By sharing leadership in dangerous environments, team members may more effectively utilize complementary KSAs to meet the demands of the situation, enabling them to effectively negotiate complex tasks (Cox, Pearce, & Perry, 2003; Klein, Ziegert, Knight, & Xiao, 2006; Pearce & Sims, 2002). In effect, increased task complexity requires increased shared leadership to achieve successful outcomes (Pearce & Sims, 2002). The elements driving dangerous contexts change the nature of group tasks from routine to challenging and complex. Working for a common goal, the group may dynamically share influence in order to meet the challenges and interconnected requirements of complex tasks rather than failing to act.

Carson et al. (2007) measured shared leadership using network density by asking each team member to rate each member of their team on the question, "To what degree does your team rely on this individual for leadership?" (p. 1225). The scale ranged from 1 (*not at all*) to 5 (*to a very great extent*). Density is a measure of the average rating for

all team members within the group. For example, an average tie rating of 5 would indicate that all team members perceived all the other members of the team to rely on each other “to a very great extent” for leadership. Consequently, a tie strength of 5 would indicate high shared leadership. The network-based density approach has proven to be effective for shared leadership (Carson et al., 2007; Mayo et al., 2003) and other team contexts (Sparrowe, Liden, Wayne, & Kraimer, 2001). In conjunction with our understanding of leadership in dangerous environments, we predict:

Hypothesis 1. The degree of shared leadership (density) in a team is positively related to team performance in dangerous environments.

However, density alone fails to capture the entire shared leadership model. The limitation with the density measure is that the average tie strength does not account for the distribution of leadership. A measure of shared leadership must not only account for the amount of leadership at the team level, but also the degree to which leadership is distributed amongst the members of the team (Conger & Pearce, 2003). Do all team members share in the responsibility of providing leadership or is it simply a few members of the team? The more leadership is distributed to qualified personnel, the better equipped a team may be able to handle a dynamic, fast-paced environment because the leadership is not focused on a single, or a few, actors. Thus, network centralization may provide us with important information and context regarding shared leadership (Gockel & Werth, 2010; Mayo et al., 2003).

<Insert Figure 1 about here>

For example, the two six-person networks in Sections A and B of Figure 1 have an average tie strength (density) of 3. In other words, the teams possess a leadership

strength of 3 or “to some extent.” The heads of the arrows point to team members nominated as demonstrating leadership within the group. In Section A of Figure 1, only three team members were nominated as leaders, but each of those members received the highest possible rating 5 or “very great extent,” while the other team members received the lowest possible rating 1 or “not at all.” In Section B of Figure 1, all six team members were nominated as leaders; each team member received ratings of 3 from each of the other members on the team. Though the average tie strength for the two networks is the same, the distribution of leadership within the networks is very different.

<Insert Table 1 about here>

The distribution of leadership is not completely captured using density in this instance; in fact, density is not able to distinguish how the ties in the team are distributed (see Table 1). In contrast to density, centralization represents a measure of distribution of ties in a network. A centralization value of 1 would indicate that one team member is regarded as the leader, and the team would be completely centralized. In contrast, Section B of Figure 1 demonstrates a completely decentralized network, where the leadership is completely, evenly distributed. The centralization of the network depicted in Section A of Figure 1 is 48%, while the centralization of Section B in Figure 1 is 0. Connecting the concept of measuring shared leadership (centralization) with team performance in dangerous contexts, we predict:

Hypothesis 2. The degree of shared leadership (centralization) in a team is positively related to team performance in dangerous environments.

This discussion of using centralization as a measure of shared leadership should not be interpreted as an argument proposing the removal of density as an indicator of

shared leadership. For example, using the scale from Carson et al. (2007), if all team members rate each other as “never” demonstrating leadership, the centralization is 0, indicating a completely decentralized network. However, the density of the network is 1, the lowest possible team leadership strength score. Thus, centralization alone is not able to completely capture shared leadership. Density and centralization should both be included as indicators of shared leadership (Gockel & Werth, 2010). Using the interaction of density and centralization as a measure of shared leadership and accounting for team performance in dangerous situations, we predict:

Hypothesis 3. The degree of shared leadership (interaction between density and centralization) in a team is positively related to team performance in dangerous environments

Method

Participants

The sample's participants included 204 service members from the US military located at bases and commands in the Midwest. The study used a fixed team size of four total individuals, forming 51 teams. Males accounted for 85.3% of the sample's members; this proportion closely represents the US military population, where males make up 85.4% of those actively serving (Department of Defense, 2012). Participant ages ranged from 18 to 48 years ($M_{age} = 24.49$; $SD = 4.57$), moderately representing the active service member population of 35.8% ranging from 18-30 years (Department of Defense & ICF International, 2010). The sample's racial diversity included 65.3% Caucasian/White, 16% African American/Black, 11.7% Other, 3.6% Asian, 2.3% Native American or Alaska Native, and 1% Native Hawaiian or Other Pacific Islander; the racial diversity nearly represents the population, where those actively serving included 70.1%

Caucasian/White, 17% African American/Black, 6.8% Other, 3.7% Asian, 1.4% Native American or Alaska Native, and 1% Native Hawaiian or Other Pacific Islander (Defense Manpower Data Center, 2010). Sixty-five percent of the sample characterized themselves as enlisted personnel, 12.7% as officers, and 22.3% as Reserve Officer Training Corps (ROTC) or Officer Candidate School (OCS); the sample accounted for partial representation of the population, where active forces included 82% enlisted, 17% officer, and 1% ROTC or OCS (Defense Manpower Data Center, 2010).

For highest level of completed education, 37.8% of the sample earned a high school degree or equivalent, 45.5% had completed 1 to 4 years of undergraduate coursework, 12.7% earned an undergraduate degree, 4% received a graduate degree, and 0.04% obtained a doctorate. Fifty-five percent served with the US Army, 18.7% with the US Marine Corps, 12.7% with the US Air Force, 11.7% with the US Navy, and 1.9% with the US Coast Guard. Finally, 68.1% of participants had no combat experience, 21% had less than 1 total year of combat, 8.8% between 1-2 years, 1.4% between 2-3 years, and 0.7% greater than 3 years. We found the sample to be well suited for testing our hypotheses. The sample's military affiliation and strong representation to the population provided us with participants who regularly trained for and operated in dangerous contexts. All participants in our sample had received combat training through the US military. Overall, the sample's characteristics increased the potential for the results to have strong external validity across other populations operating in dangerous situations.

Procedure

The study received university Institutional Review Board (IRB) approval to collect data from participants in a quantitative field study, using team combat scenarios,

at a modern, Midwestern, military urban fighting training complex. We recruited participants by delivering briefs and presentations at various military commands in the Midwest. Initially, 292 total service members volunteered to participate. Prior to the conduct of the study, we used random sampling procedures to form 73 teams and assigned each with a single appointment time at the research site to complete a counterinsurgency combat scenario similar to those regularly used to prepare service members for contingency operations in central Helmand Province, Afghanistan. However, during the execution of the study, 88 participants failed to appear during their assigned time slots. In order to maintain the fixed team size of the study, we transitioned to convenience sampling by combining teams with missing members together into new four-person teams, resulting in a final total of $N = 204$ participants placed into $N = 51$ teams. Additionally, the study received the support of three military combat instructors to act as third-party objective performance raters and four scenario role players to represent local civilians and enemy insurgent forces.

In order to create a constant dangerous environment to test our model while still providing a safe research site for the participants, the study employed 40 M-4 Carbine-like paintball weapons, 20,000 paintball rounds, and associated personal protective equipment (PPE). The paintball weapons served two primary functions. First, they provided a strong element of danger during the scenarios. With PPE, body strikes from paintballs rarely result in significant injuries; however, paintball body strike may induce temporary pain. Second, strikes from the paintballs would enable performance raters to objectively determine/classify casualties for team members and role players during each scenario. The use of paintball weapons provided a very realistic element to the combat

scenarios, simulating the threats and dangers of small arms fire found in combat operations. For each scenario, all team member participants received 30 paintball rounds, one paintball weapon, and an extensive package of required PPE (helmet, face mask/shield, gloves, knee and elbow pads, etc.). Two role players acted and dressed as local civilians, receiving PPE, but no weaponry. Two others played the role of enemy insurgent forces, receiving the same equipment and weaponry as the friendly force teams, but able to reload between scenarios.

To provide a common dangerous context scenario requiring the use of general military skills known to the participants, the study employed an existing pre-combat deployment training exercise modified specifically to accommodate the research site. The scenario challenged each team to patrol the research site, known for hostile enemy activity, in order to obtain an object of critical intelligence (map) from a friendly, local village elder (role player). Upon contact with the elder, enemy forces (role players) engaged the teams using the paintball weapons in the form of a complex ambush. Teams negotiated this dangerous situation in a variety of ways in order to accomplish the mission for the scenario. Role players received a detailed safety briefing, a scenario script, and specific guidelines for the conduct of a common scenario. After also receiving a thorough safety brief, the research site supervisor randomly designated one team member as the team leader, provided teams with a single map of the urban fighting complex, and delivered a detailed mission briefing using a script to inform teams of their common objectives, constraints, restrictions, obstacles, challenges, support apparatus, and rules of engagement (ROE). Following the mission brief, each team received 10 minutes to statically plan their efforts to accomplish the mission. Each team executed the same

combat scenario, to include a maximum time limit of 20 minutes. Third-party objective raters completed performance grade sheets for each team during the events. At the completion of each scenario, we collected data from each participant via paper questionnaires (see Appendix A in this article).

Measures

Shared leadership. The study measured shared leadership using a social network method in two distinct forms. First, we accounted for team density (Carson et al., 2007; Mayo et al., 2003) by measuring the amount of leadership exhibited by each team member as perceived by all team members individually. Each team member used the Carson et al. (2007) scale to answer two questions concerning the influence of the other three team members: “To what degree did your team rely on this individual for leadership?” and “To what degree did you rely on this individual for leadership?” Density is calculated as the total amount of leadership displayed by the team—the sum of valued leadership ratings for each team member divided by the total number of members on the team. A team density score of 5 would reflect the maximum possible amount of shared leadership on a team; whereas, a density score of 1 would indicate no shared leadership within the team.

Second, we accounted for team network centralization (Gockel & Werth, 2010; Mayo et al., 2003) to measure shared leadership. Network centralization provides researchers with a measure demonstrating the degree to which perceived leadership was distributed throughout the team. The general formula for centralization (Freeman, 1979, p. 228) is:

$$C_x = \frac{\sum_{i=1}^n [\max C_x(p) - C_x(p_i)]}{\max \sum_{i=1}^n [\max C_x(p) - C_x(p_i)]}$$

C_x is the centralization of the network. $C_x(p_i)$ is the value of leadership ratings received (indegree) by a particular team member. Each team member's indegree centrality is subtracted from the maximum centrality measure in the network, and the sum of the differences is calculated as the value for the numerator. For the denominator value, the maximum possible sum of differences between a hypothetical extreme team, where one person receives all the nomination and other members do not, is used. Centralization is measured from 0 to 1, where 0 is a completely decentralized network (perceived leadership is spread across more team members), and 1 is a completely centralized network (perceived leadership is concentrated to small number of team members).

Team performance. Three military instructors, with the distinction of subject matter experts (SME) regarding team combat performance, observed the conduct of the scenario events. These third-party objective raters used a common grade sheet with seven total items to rate the performance of each team. Using a standard military performance grade sheet modified for the study's specific scenario, we weighted each scaled item to form a summed possible total score of 0-35 points. Rated items included: time to complete the scenario, total number of civilian casualties inflicted, total number of friendly force casualties received, total number of team members to be properly extracted at the conclusion of the mission, ratings on the team's effectiveness to neutralize the enemy threat, ratings on the team's adherence to the established ROE, and rating the team's overall mission accomplishment (completing their primary objective per

the scenario). The SMEs closely followed each team within the boundaries of the research site, taking notes and observations to complete the team performance rating items; raters determined the final scores for each grade sheet item at the conclusion of each scenario. We originally planned for all three performance raters to observe each team. However, due to time constraints at the research site, each rater only observed a proportion of the teams as a single rater. Due to each rater's strong familiarization with the scenario, grade sheet, several hundred previous observations, and highly credible military evaluation experience, we determined the ratings to be valid.

Control variables. In order to fully address other possible explanations for our results, we controlled for potential nuisance variables, such as the effects of team size, combat experience, racial diversity, and gender diversity. First, teams with varying sizes may moderate the relationship between leadership and team performance (Campion, Papper, & Medsker, 1996; Kirkman & Rosen, 1999; Magjuka & Baldwin, 1991; O'Connell, Doverspike, & Cober, 2002; Pearce & Herbig, 2004). To control for team size, we designed the experiment to support fixed team of four members. Varying levels of task experience, in this case combat experience, may have a moderating effect on team performance (Hollenbeck, Ilgen, LePine, Colquitt, & Hedlund, 1998). To measure combat experience, we asked participants to rate their total combat experience in years, from no combat experience ("0") to greater than five total years of combat experience ("5"). To control for combat experience at the team level, we aggregated the total number of years of combat experience across each team. Racial and gender diversity may also impact team performance (Chandler, Honig, & Wiklund, 2005; Homan, van Knippenberg, Kleef, & De Dreu, 2007; Pitts, 2005). We measured gender and racial

characteristics of the participants via standard demographics questions. To control for these types of diversity, we quantified the corresponding diversity of a team with gender and race using the Blau Index (Blau, 1977).

Qualitative Data Collection for Construct Validity

In addition to the quantitative design of this project, we conducted a qualitative collection of leadership definition and observation data from the participants in order to verify the construct validity of leadership for the study. To accomplish this research objective, we employed the case study qualitative tradition of inquiry. Case studies represent an in-depth description of a bounded system (Merriam, 2009). Rather than focusing on the research topic, the case study method investigates specific instances by which the topic may be bounded; the outputs include case-based themes and description (Creswell, 2007; Merriam, 2009). The primary objective of this case study is to describe and develop understanding of participants' definitions and observations of leadership in dangerous environments. The unit of analysis of this study is US military personnel in four-person-sized combat teams from the field study. The case study provides us with the ability to build richly descriptive results addressing construct validity of leadership in our study.

To examine the construct validity of leadership for the study, qualitative data was collected simultaneously with quantitative data. In addition to filling out bubble-sheet-style quantitative surveys, we asked the participants to answer two questions providing us with their personal definition of leadership and examples/observations of leadership by others within their team during the scenario (see Appendix B in this article). Participants answered each question by physically writing their answers on paper containing ample

blank space for their responses. The first question required a single response to, “In the space below, please provide a definition of leadership. I think leadership is....” The second question required participants to make three total responses, one for each of their teammates, answering, “Please provide examples of this person’s leadership or lack of leadership during the scenario. This person was or was not a leader because....” Following the completion of these qualitative responses by the participants, the researchers ordered and stored the data by team in preparation for the qualitative analysis.

Analysis and Results

Quantitative

<Insert Table 2 about here>

<Insert Table 3 about here>

Table 2 provides descriptive statistics to include means, standard deviations, and zero-order correlations for all analyses. For testing Hypothesis 1, we employed a multiple regression analysis. Entering shared leadership (density) and all control variables into this analysis enabled us to test the relationship, the predictors, and team performance (see Table 3 for these results). We found shared leadership (density) positively and significantly related to team performance ($\beta = .33, p = .014$), supporting Hypothesis 1. This analysis also showed the control variable of team combat experience to be positively and significantly related to team performance ($\beta = .44, p < .001$); however, we discovered team and gender diversity were not significantly related to performance.

<Insert Table 4 about here>

For testing Hypothesis 2, we repeated the same multiple regression analysis, but replaced shared leadership (density) with shared leadership (centralization). Shared leadership (centralization) was not significantly related to team performance ($\beta = .16, p = .27$), failing to show support for Hypothesis 2 (see Table 4 for these results). Additionally, this analysis also showed the control variable of team combat experience ($\beta = .65, p < .001$) to be positively and significantly related to team performance. Finally, this analysis also found the control variables of team racial diversity ($\beta = -.29, p = .02$) and gender diversity ($\beta = -.35, p = .003$) to be negatively and significantly related to team performance.

<Insert Table 5 about here>

For testing Hypothesis 3, we repeated the same multiple regression analysis, but added shared leadership (density), shared leadership (centralization), and shared leadership (density * centralization) interaction to examine their relationship with team performance. Shared leadership (density) ($\beta = .24, p = .40$), shared leadership (centralization) ($\beta = -.18, p = .75$), and shared leadership (density * centralization) interaction ($\beta = .40, p = .42$) all were not significantly related to team performance, failing to show support for Hypothesis 3 (see Table 5 for these results). Team combat experience ($\beta = .49, p < .001$) and team racial diversity ($\beta = -.26, p = .03$), were significantly related to team performance.

<Insert Table 6 about here>

Finally, from the results of the previous three analyses, we wanted to learn more about the relationships of all the predictors in this study and team performance (see Table

6 for these results). Using a stepwise multiple regression to determine the best predictor of team performance, Model 1 found shared leadership (density) positively and significantly predicted team performance ($\beta = .63, p < .001$) and accounted for 40% of variance in team performance ($R^2 = .40, p < .001$). Model 2 found shared leadership (density) positively and significantly predicted team performance ($\beta = .46, p < .001$). This model also showed the control variable of team combat experience positively and significantly predicted team performance ($\beta = .35, p < .001$) and accounted for an additional 9% of variance in team performance ($\Delta R^2 = .09, p < .001$) above and beyond shared leadership (density). Thus, shared leadership (density) and combat experience account for 49% of the variance in team performance ($R^2 = .49, p < .001$).

Qualitative

The study used a post-data collection analysis strategy (Merriam, 2009). After completing the qualitative data collection, we transcribed all of the qualitative question responses via computer type, maintaining the previous ordering convention by team. With each team containing four members and 51 total teams in the study, we named and ordered participants by team number (i.e., 1, 2, 3, 4) and team member (i.e., A, B, C, or D); for example, the second member of the 21st team received the naming convention of “Participant 21B.” During the transcription process, we found 5 of the 204 participants failed to respond to the leadership definition question; additionally, we found another three responses to be classified as illegible, leaving 196 useful responses available for the analysis. For the leader observations and examples, we found 6 of the 204 participants did not respond to about 18 of their peers’ leadership; additionally, we found another 10 responses to be classified as illegible, leaving 574 useful responses available for the

analysis. Following the transcription, we printed off the transcribed responses to support the shorthand designation process coding. With these tasks complete, we conducted a preliminary exploratory analysis (Creswell, 2008) to obtain a general sense of the data's content and direction. The preliminary exploratory analysis provided us general orientation to data trends and confirmation of the presence of enough data for the final analysis.

For the qualitative analysis, we used a typological hand-analysis data coding method (Creswell, 2008; Hatch, 2002). The method required us to divide data sets into groups using typological categories in order to find patterns and develop themes (Hatch, 2002). Unlike modern computer programs that automatically store, analyze, and make sense of this type of data, the hand-analysis method requires scholars to manually develop typological categories, read the data, color code the text, and derive themes (Creswell, 2008). We decided against using computers for the analysis due to the small data pool and our high proficiency for manual coding.

<Insert Table 7 about here>

The primary objective of the qualitative analysis was to make sense of the data through the discovery of themes (Creswell, 2007). These findings answer the original research question and develop a strong understanding of the central phenomenon (Creswell, 2008). The analysis of qualitative data is primarily inductive and comparative (Merriam, 2009); we organized our analytical process around organizing, consolidating, coding, comparing, reducing, and interpreting the qualitative data to form richly descriptive findings. During our initial coding process, we identified text segments within the data, assigning code words describing the meaning of each segment (Creswell,

2008) to find 24 total code words/phrases. These codes were then compared for overlapping trends meaning and redundancy; from this action, we reduced the total number of codes to 10. We reviewed the data a final time, finding five total themes (three primary and two supporting) describing the participants perceived leadership (see Table 7).

Primary themes.

Process. The participants primarily described leadership as a process. Participant 24B emphasized in his definition that leadership is, “The ability of a person to rise up during highly dynamic situations to inspire others to complete a task.” Elements describing leadership as a process for the military team members in dangerous work settings included change, taking charge of the team, and emergence. Participant 31A explained that leadership “occurs when a change requires someone to direct and motivate a team to stay on task.” Additionally, Participant 33A described another team member’s leadership as, “Changing from giving orders to giving recommendations to motivating us to going back to giving orders again so we could accomplish the mission.” The participants assessed change to be an inherent element in leadership, contributing to the overall process of leadership.

The participants also described leadership as a process of emergence. Participant 38D observed one of her team members “possessed a lot of real-world combat experience and would shout out commands when nothing was happening, but would stop giving orders when the designated team leader spoke.” Participant 50C stated about another team member, “At some point we could not find our team leader, so he simply took charge of the team and told us what to do next.” Participant 25D also explained a lack of

emergence failed to stimulate leadership as a process: “Our designated team leader did not know what to do. He did not communicate with us and appeared to be lost.

However, no one else jumped in to take control, so we just continued to get shot and do nothing.” Participant 13A, a designated team leader, stated of another member, “I was the first to die, so he used his experience and skills to take control of the team and get them out of trouble.” The participants viewed leadership as dynamic rather than static. As a result, they perceived the serial emergence of leadership within their teams as a standard action within a larger process.

Influence. The participants primarily described leadership as influence.

Participant 34B stated in his definition that leadership is “influencing others through direction, motivation, enthusiasm, setting the example, etc., depending on the situation and the follower capabilities.” Components describing leadership as influence for the military team members in dangerous environments included providing direction, guidance, inspiration, motivation, setting the example for others, and experience.

Participant 31C defined leadership as, “Communicating the mission, providing commands, and giving direction in the face of change and adversity.” Core elements of this definition reflect direction as influence. Additionally, Participant 43A described leadership as, “Directing people to do more through your actions, abilities, and experience.” Participant 43A also explained another team’s leadership to be effective due to his “quick decisions and good communication to tell us what to do.” The participants perceived directions, commands, and orders as standard influence tactics of leaders in this environment.

The participants also described leadership as an influence through inspiration and motivation. Participant 50D observed that one of his teammates “motivated me to follow his lead by effortlessly braving intense fire to move out of our poor position to attend to our team leader who just got shot.” For this participant, inspiration and motivation—rather than orders or directions—contributed to the perceived influence of his brave teammate. Participant 50C also stated about the same brave team member, “He always led the charge into each room, seemingly unafraid of the enemy’s presence. This inspired me to follow him everywhere in the town.” Participant 26B also explained a lack of inspiration and motivation from his team leader contributed to a lack of influence: “Her lack of confidence once rounds started down range did not inspire me.” Participant 36A, a designated team leader, stated of another member, “After we got the map, he screamed ‘Follow me,’ and blasted enemy fighters while on a dead sprint, totally motivating!” The participants not only followed military-style orders and direction, they also perceived ingratiation and motivational influence from others they deemed as providing leadership.

The participants explained leadership as an influence through others setting the example and their overall level of combat experience. Participant 17B observed one of his teammates “was a squad leader in Iraq, so he drew up our team’s plan and we all agreed to follow it.” The same participant also commented about another team member, “She was a military nurse I think, so I did not follow her much.” This participant valued task experience and perceived influence from the more experienced team members. Participant 49B explained her team leader “always did what he asked of us, so it was easy to follow him.” The participant perceived influence from her team leader as setting the example for others to follow. Participant 49C, from the same team, explained the team

leader “had a lot of combat experience and told us how to move quickly when getting shot at. He was the first to run across the street to the extract point, making it easy for us to do the same.” The participants perceived their team members setting the example and possessing relevant task experience as providing influence and serving as leaders during the scenarios.

Common goals. The participants primarily expressed leadership as containing common goals. A large number of perceived definitions of leadership included terminology relating to shared, common, mutual, and collective goals, objectives, targets, missions, and purposes. Participant 10A stated leadership is “getting others to achieve common objectives.” Participant 33A explained leadership as “directing and commanding a team to accomplish a shared mission.” Participant 38D described leadership as “building teams and getting results to support mutual interests.” It appears the participants did not perceive leadership as unilateral. Rather, they described leadership as a process to achieve or accomplish multilateral interests. Participant 28D explained his team’s designated leader “effectively communicated our common mission was to get the map and make it to the extraction point and that everything else was secondary.” The participants perceived common goals to be an inherent element in leadership, representing the end result for the process of leadership.

Supporting themes.

Situational awareness. The participants described leadership as contingent upon or related to a given situation, environment, or context. Participant 26C stated leadership is “dealing with the mission, situation, and people to get things done.” Participant 32A perceived leadership as “the process of understanding the environment, team, and your

own abilities to take actions fostering group success.” Participant 15D described leadership as “the ability to lead under fire and stress and successfully complete your unit’s mission or goal.” Participant 9D described leadership as “the ability to step forward and take responsibility of a group in any given situation.” The participants perceive leadership as contextual. Rather than conducted in a vacuum, the participants describe the situation as an important factor in the overall leadership process. Additionally, they perceive having awareness of situational dynamism as a characteristic of leaders. Participant 5A stated of another team mate, “He spread out his extra ammo to all the team members. When I opened up my hopper, I had only two rounds left and I didn’t know it, but he had figured it out on his own.” Participant 7B stated of another team member, “I lost track of time, but he kept looking at his watch and advising me to hurry up or we would miss the extraction timeline.” These examples illustrate the participants’ perceived value of situational awareness in their leaders.

Follower awareness. The participants explained leadership as contingent upon or related to a follower’s knowledge, skills, abilities, and experiences. They acknowledged both the follower’s role and their varying capabilities as an element of the leadership process. Participant 4C stated leadership is “accomplishing team objectives by knowing the mission, your people, and how to take charge.” Participant 18A perceived leadership as “making decisions based on the environment, followers, team’s mission, and yourself.” Participant 15C described leadership as “effectively using your resources and followers’ talent to get results.” The participants perceive leadership as relational. They perceive it as a dyadic influence process in which each follower possesses different characteristics. Additionally, they perceive having a strong awareness of each follower’s

characteristics is related to leadership. Participant 29A stated of another teammate, “He knew I did not have the same experience, so he helped me develop the tactical plan to get the map.” Participant 9A stated of another team member, “She did not seem to have a lot of confidence, but always followed my orders, so I counted on her to listen well and follow directions.” From a lack of leadership point of view, Participant 17D stated of his team leader, “She didn’t seem to know much about our abilities after we explained them to her.” These examples illustrate the participants’ perceived value of follower awareness in leaders.

Discussion

Answering the calls of multiple leadership scholars to conduct empirical management research in team and extreme contexts, this project makes several contributions to the field of study. First, we empirically examined shared leadership and team performance using an innovative field study design and representative sample in a simulated dangerous environment, a previously unexplored context for this area of management research. We found military teams operating in an extreme context achieved high performance by sharing leadership. This important discovery implies shared leadership may be more of a “reality” than a “pipedream” in a military culture traditionally rigid in hierarchical leadership (Lindsay et al., 2011, p. 548).

Second, our research has found the SNA density measure of shared leadership to be a better predictor of team performance than centralization or the interaction of density and centralization. Our findings did not support two of our hypotheses regarding centralization or the interaction of density and centralization, and contradict the study conducted by Small and Rentsch (2010) who reported that centralization predicted team

performance in a business school simulation study. Although the dangerous context may be one reason for the contradictory results, another key difference between these two studies was the amount of time participants engaged in the simulations. Students in the Small and Rentsch (2010) study were engaged in an 8-week-long simulation, whereas participants in this study were engaged in the simulation for no more than 30 minutes (preparation time and simulation time combined). Perhaps, during a short period of time and in a dynamic dangerous environment, the distribution of leadership may not be as impactful as in a more long-term work environment. Perhaps over a short period of time, a team can rely on a less distributed leadership network and be successful, as long as a certain level of leadership is displayed within the team (density). This explanation should be tested to better understand the boundary conditions of shared leadership.

Third, we qualitatively collected, analyzed, and presented the results of the leadership definitions and observations as perceived and experienced by the participants of the team scenarios. Collected at the same time as the quantitative data, we wanted to learn both what described the participants' perception of leadership and how this perception supported the construct validity of our shared leadership measure. We found the primary themes of process, influence, and common goals—as well as the supporting themes of situational and follower awareness—described the participants' perception of leadership. They viewed leadership as a process, where leaders with the awareness of the situation and their followers' capabilities, influenced a group to achieve common goals. The participants did not perceive leadership as positional power. Additionally, they did not characterize leadership as authority. Rather, they perceived leadership as contextual, requiring more than hierarchical power.

Fourth, in terms of our quantitative measure of leadership in this study, each team member used the Carson et al. (2007) scale to answer two questions concerning the influence of the other three team members: “To what degree did your team rely on this individual for leadership” and “To what degree did you rely on this individual for leadership?” However, did we measure leadership? Northouse (2010) defines leadership as “a process whereby an individual influences a group of individuals to achieve a common goal” (p. 3). Additionally, Yukl (2010) states, “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). Finally, the US Army defines leadership as, “The process of influencing people by providing purpose, direction, and motivation, while operating to accomplish the mission and improve the organization” (p. G3). These definitions possess many of the themes from the participants’ qualitative responses, such as process, influence, and common goals. Additionally, the participants perceived leadership to be contextual, requiring individuals to understand the environment and their people within the larger process. As a result, our scale of leadership appears to contain construct validity, measuring what we intended to collect—leadership.

Finally, our results confirm and extend a growing body of shared leadership research, highlighting the positive effects of shared leadership on team performance using a SNA measure of shared leadership. These combined efforts advance the field of study by presenting new bridges to multiple theoretical gaps in extreme context, team, and shared leadership research.

Implications

Our study's results suggest a promising future for shared leadership in teams operating in dangerous or extreme contexts. We found military teams relying on multiple individuals for influence in a combat scenario performed at higher levels than those functioning under a vertical model. These results do not imply an end of vertical leadership in dangerous or conventional contexts. Rather, the findings suggest shared leadership may be as viable of a leadership framework as traditional models of downward influence during extreme situations. As the employment of self-managed teams continues to increase (Houghton, Neck, & Manz, 2003; Manz & Sims, 1993), organizations with the potential of operating in dangerous environments (military, police, firefighting, search and rescue, aircrew, other government organizations, etc.) may find it more valuable to approach shared leadership as a complement to traditional team models.

Unlike conventional contexts where a lack of performance may negatively impact profits, market share, stock prices, etc., the performance of teams in extreme contexts is truly a matter of life and death. Our line of inquiry may have a profound impact on the leadership processes practiced by teams in the most extreme situations. Organizations in extreme context may be best served by investigating shared leadership's place in their culture and practice, specifically identifying new training, education, and opportunities to stimulate the development of shared leadership in their teams. Examples of this in practice may include greater role clarification and highly specialized training for team members; the selection of self-managed team members' social power capacity; and increasing requirements for practical, scenario-based shared leadership training for teams likely to operate in extreme contexts. This may enable organizations to execute previously ignored team shared influence practices in the most dangerous situations.

Extending previous scholarly efforts to measure shared leadership using SNA (Carson et al., 2007; Gockel & Werth, 2010; Mayo et al., 2003; Sparrowe et al., 2001), we echo their recommendations for employing a network-based approach for measuring shared leadership in teams. By addressing more relationships within teams, we believe that our measure of shared leadership demonstrates a better conceptual match to the theory of shared leadership. Also, by confirming that the density measure of shared leadership predicts team performance, we reinforce the work of Carson et al. (2007). Although our findings did not support the use of centralization to predict team performance (Gockel & Werth, 2010; Mayo et al., 2003), several factors could have influenced our results. As mentioned, the amount of time teams were engaged in the simulation could impact the need for leadership to be widely distributed across a team. Teams working together for a short period of time may not need to distribute leadership as much as teams working together for a longer period of time. The size of teams could also be a factor in the need for leadership to be distributed. Perhaps in a relatively small team, the need to distribute leadership is not as vital as long as there is a certain level of leadership demonstrated by one or two members of the team.

Limitations and Recommendations

Our study contains limitations requiring further attention in future research. First, our research used a cross-sectional design, focusing on identifying correlations and relationships rather than determining causality. As an inherently emergent phenomenon, future studies of shared leadership may benefit more from strong experimental and longitudinal designs in order to fully comprehend the concept's development and causal nature on outcomes. Second, although our sample strongly represented its population, we

failed to address shared leadership in existing, established, self-managed teams regularly found in the modern military, such as special operations forces, combat aircrew, etc. Future studies may be better served by testing shared leadership in established military teams in order to increase external validity and practical applications. Third, the design of our study used fixed team sizes in order to control for this variable. Team size may act as a moderating variable in shared leadership models. Future research projects may discover more about the effect larger teams may have on the formation and outcomes of shared leadership by varying team size in their designs. Finally, our shared leadership survey items captured perceived leadership of other team members. With varying definitions populating the leadership field, our study may have captured inconsistent assessments of leadership. Future studies should provide participants with examples of leadership prior to collecting data, especially in unconventional scenarios where perceived influence may appear different from conventional situations.

A number of areas exist for scholars to advance the study of shared leadership in dangerous contexts. Boundary conditions—such as team cultural diversity (Ramthun & Matkin, 2012); team social power distribution (Ramthun & McElravy, 2012); team member turnover, team composition, team size, team function (Pearce & Conger, 2003); and team knowledge, skills, and abilities or experience levels (Ramthun, 2012)—may play key moderating or mediating roles in the development and outcomes of shared influence. Conducting research in these areas may provide answers to organizations to more effectively develop, train, and sustain shared leadership practices in teams. Finally, scholars may encounter IRB and field research site challenges complicating the study of shared leadership in dangerous environments. The general mission of an IRB is to ensure

research participants are not placed at undue risk, provide informed consent to their participation, and rights are protected during the conduct of studies. Proposing research in dangerous contexts, where an element of death or psychological injury exists, may prevent researchers from receiving permission to test models in extreme situations, as this may increase the risk of harm to participants. As a result, researchers must use balance when developing projects in order to simulate danger while at the same time protecting participants as well as ensuring proper medical and psychological care is available during and after the conclusion of studies. Researchers may accomplish this by conducting research projects in conjunction with dangerous training events regularly completed by samples operating in extreme contexts. For example, researchers may seek to integrate studies into military or law enforcement training programs conducting live fire team scenarios. This ensures the sample has regular experience in this dangerous training realm, providing less risk to participants and passing IRB standards for approval.

Conclusion

As organizations continue to use teams to solve complex problems in dangerous situations and as the potential outcomes inherent to dangerous environments literally spell life or death, a requirement exists to obtain an improved understanding of those practices stimulating effective team leadership. Our study furthers the field of management by drawing attention to the value of shared influence within teams operating in dangerous situations and the most effective measures of the shared leadership phenomenon. Specifically, our research suggests shared leadership represents an important variable stimulating high team performance under the most extreme conditions. Additionally, we suggest continuing to test the SNA measures of shared leadership,

density, and centralization. While they are conceptually consistent with the theory of shared leadership, they still need further refinement. Though our results demonstrate noteworthy discoveries in team, shared leadership, and dangerous contextual research, increased investigation within this line of inquiry may further enable organizations to more effectively realize the positive outcomes shared influence has to offer.

REFERENCES

- Aldrich, H. (1979). *Organizations and environments*. Englewood Cliffs, NJ: Prentice-Hall.
- Antonakis, J., Schriesheim, C., Donovan, J., Gopalakrishna-Pillai, K., Pellegrini, E., & Rossomme, J. (2004). Methods for studying leadership. In J. Antonakis, A. Cianciolo, & R. Sternberg (Eds.), *The nature of leadership* (pp. 48-70). Thousand Oaks, CA: Sage.
- Avolio, B., Jung, D., Murry, W., & Sivasubramaniam, N. (1996). Building highly developed teams: Focusing on shared leadership process, efficacy, trust, and performance. In M. Beyerlein, D. Johnson, & S. Beyerlein (Eds.), *Advances in interdisciplinary studies of work teams* (pp. 173-209). Greenwich, CT: JAI Press.
- Avolio, B., Sivasubramaniam, N., Murry, W., Jung, D., & Garger, J. (2003). Assessing shared leadership: Development and preliminary validation of a team multifactor leadership questionnaire. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 141-172). Thousand Oaks, CA: Sage.
- Baran, B., & Scott, C. (2010). Organizing ambiguity: A grounded theory of leadership and sensemaking within dangerous contexts. *Military Psychology*, 22(Suppl. 1), S242-S269.
- Bergman, J., Rentsch, J., Small, E., Davenport, S., & Bergman, S. (2012). The shared leadership process in decision-making teams. *Journal of Social Psychology*, 152(1), 17-42.
- Blau, P. (1977). *Inequality and heterogeneity*. New York: Free Press.
- Boe, O., Woolley, K., & Durkin, J. (2011). Choosing the elite: Recruitment, assessment, and selection of law enforcement tactical teams and military special forces. In P. Sweeney, M. Matthews, & P. Lester (Eds.), *Leadership in dangerous situations: A handbook for the armed forces, emergency services, and first responders* (pp. 333-349). Annapolis, MD: Naval Institute Press.
- Boies, K., Lvina, E., & Martens, M. (2010). Shared leadership and team performance in a business strategy simulation. *Journal of Personnel Psychology*, 9(4), 195-202.
- Borgatti, S., & Foster, P. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, 29(6), 991-1013.

- Bourgeois, L., III, & Eisenhardt, K. (1988). Strategic decision process in high velocity environments: Four cases in the microcomputer industry. *Management Science*, 34(7), 816-835.
- Campbell, D., Hannah, S., & Matthews, M. (2010). Leadership in military and other dangerous contexts: Introduction to the special topic issue. *Military Psychology*, 22(Suppl. 1), S1-S14.
- Campion, M., Papper, E., & Medsker, G. (1996). Relations between work team characteristics and effectiveness: A replication and extension. *Personnel Psychology*, 49, 429-452.
- Carson, J., Tesluk, P., & Marrone, J. (2007). Shared leadership in teams: An investigation of antecedent conditions and performance. *Academy of Management Journal*, 50(5), 1217-1234.
- Chandler, G., Honig, & Wiklund, J. (2005). Antecedents, moderators, and performance consequences of membership change in new venture teams. *Journal of Business Venturing*, 20, 705-725.
- Conger, J., & Kanungo, R. (1998). *Charismatic leadership in organizations*. Thousand Oaks, CA: Sage.
- Conger, J., & Pearce, C. (2003). A landscape of opportunities: Future research on shared leadership. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 285-303). Thousand Oaks, CA: Sage.
- Cordery, J., Mueller, W., & Smith, L. (1991). Attitudinal and behavior effects of autonomous group working: A longitudinal field study. *Academy of Management Journal*, 34(2), 464-476.
- Cox, J., Pearce, C., & Perry, M. (2003). Toward a model of shared leadership and distributed influence in the innovation process: How shared leadership can enhance new product development team dynamics and effectiveness. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 48-76). Thousand Oaks, CA: Sage.
- Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.
- Creswell, J. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle Creek, NJ: Pearson Education.

- Day, D., Gronn, P., & Salas, E. (2004). Leadership capacity in teams. *The Leadership Quarterly*, 15(6), 857-880.
- Day, D., Gronn, P., & Salas, E. (2006). Leadership in team-based organizations: On the threshold of a new era. *The Leadership Quarterly*, 17(3), 211-216.
- Defense Manpower Data Center. (April, 2010). *Destruction of active duty services by service, rank, sex, and race with hispanic indicator*. Retrieved from http://www.dmdc.osd.mil/Rank_Gender_Race.xls
- Department of Defense. (September, 2012). *Active duty military personnel by rank/grade*. Retrieved from <http://siadapp.dmdc.osd.mil/personnel/MILITARY/miltop.htm>
- Department of Defense and ICF International. (2010). *Demographics 2010: Profile of the military community*. Retrieved from http://www.militaryonesource.mil/12038/Project%20Documents/MilitaryHOMEFRONT/Reports/2010_Demographics_Report.pdf
- Dess, G., & Beard, D. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly*, 29(1), 52-73.
- Dubin, R. (1976). Theory building in applied areas. In M. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 17-39). Chicago, IL: Rand McNally.
- Dunphy, D. (2000). Embracing paradox: Top-down versus participative management of organizational change. In M. Beer & N. Nohria (Eds.), *Breaking the code of change* (pp. 123-136). Boston, MA: Harvard Business School Press.
- Eisenhardt, K. (1989). Making fast strategic decisions in high velocity environments. *Academy of Management Journal*, 32(3), 543-576.
- Eisenhardt, K., & Bourgeois, L., III. (1988). Politics of strategic decision making in high velocity environments: Toward a midrange theory. *Academy of Management Journal*, 31(4), 737-770.
- Ensley, M., Hmieleski, K., & Pearce, C. (2006). The importance of vertical and shared leadership within new venture top management teams: Implications for the performance of startups. *The Leadership Quarterly*, 17(3), 217-231.
- Ensley, M., Pearce, C., & Hmieleski, K. (2006). The moderating effect of environmental dynamism on the relationship between entrepreneur leadership behavior and new venture performance. *Journal of Business Venturing*, 21(2), 243-263.

- Freeman, L. C. (1979). Centrality in social networks: Conceptual clarification. *Social Networks*, 1(3), 215-239.
- Gockel, C., & Werth, L. (2010). Measuring and modeling shared leadership: Traditional approaches and new ideas. *Journal of Personnel Psychology*, 9(4), 172-180.
- Hart, P., & Cooper, C. (2002). Occupational stress: Toward a more integrated framework. In N. Anderson, D. Ones, H. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work, and organizational psychology* (Vol. 2, pp. 93-114). London: Sage.
- Hatch, J. (2002). *Doing qualitative research in educational settings*. Albany: State University of New York Press.
- Hollenbeck, J., Ilgen, D., LePine, J., Colquitt, J., & Hedlund, J. (1998). Extending the multilevel theory of team decision making: Effects of feedback and experience in hierarchical teams. *Academy of Management Journal*, 41(3), 269-282.
- Homan, A., van Knippenberg, D., Kleef, G., & De Dreu, C. (2007). Bridging faultlines by valuing diversity: Diversity beliefs, information elaboration, and performance in diverse work groups. *Journal of Applied Psychology*, 92(5), 1189-1199.
- Hoppe, B., & Reinelt, C. (2010). Social network analysis and the evaluation of leadership networks. *The Leadership Quarterly*, 21, 600-619.
- Houghton, J., Neck, C., & Manz, C. (2003). Self-leadership and superleadership: The heart and art of creating shared leadership in teams. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 123-140). Thousand Oaks, CA: Sage.
- Hunt, J. (1999). Transformational/charismatic leadership's transformation of the field: An historical essay. *The Leadership Quarterly*, 10(2), 129-144.
- Khasawneh, S. (2011). Shared leadership and organizational citizenship behaviour in Jordanian public universities: Developing a global workforce for the 21st century. *Educational Management Administration & Leadership*, 39(5), 621-634.
- Kirkman, B., & Rosen, B. (1999). Beyond self-management: Antecedents and consequences of team empowerment. *Academy of Management Journal*, 42, 58-74.
- Klein, K., Ziegert, J., Knight, A., & Xiao, Y. (2006). Dynamic delegation: Shared, hierarchical, and deindividualized leadership in extreme action teams. *Administrative Science Quarterly*, 51(4), 590-621.

- Kolditz, T. (2007). *In extremis leadership: Leading as if your life depended on it*. San Francisco: Jossey-Bass.
- Kozlowski, S., & Bell, B. (2003). Work groups and teams in organizations. In W. C. Borman, D. Ilgen, & R. Klimoski (Eds.), *Comprehensive handbook of psychology: Industrial and organizational psychology* (pp. 333-375). New York: John Wiley.
- Lin, Z., Zhao, X., Ismail, K., & Carley, K. (2006). Organizational design and restructuring in response to crises: Lessons from computational modeling and real-world cases. *Organization Science*, 17(5), 598-618.
- Lindsay, D., Day, D., Halpin, S. (2011). Shared leadership in the military: Reality, possibility, or pipedream? *Military Psychology*, 23(5), 528-549.
- Magjuka, R., & Baldwin, T. (1991). Team-based employee involvement programs: Effects of design and administration. *Personnel Psychology*, 44(4), 793-812.
- Manz, C., Manz, K., Adams, S., & Shipper, F. (2010). A model of values-based shared leadership and sustainable performance. *Journal of Personnel Psychology*, 9(4), 212-217.
- Manz, C., & Sims, H. (1987). Leading workers to lead themselves: The external leadership of self-managing work teams. *Administrative Science Quarterly*, 32(1), 106-128.
- Manz, C., & Sims, H. (1993). *Business without bosses: How self-managing teams are building high-performing companies*. New York: John Wiley and Sons.
- Manz, C., & Sims, H. (2001). *The new superleadership: Leading others to lead themselves*. San Francisco, CA: Berrett-Koehler.
- Mayo, M., Meindl, J., & Pastor, J. (2003). Shared leadership in work teams. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the how and whys of leadership* (pp. 193-214). Thousand Oaks, CA: Sage.
- Mehra, A., Smith, B., Dixon, A., & Robertson, B. (2006). Distributed leadership in teams: The network of leadership perceptions and team performance. *The Leadership Quarterly*, 17(3), 232-245.
- Merriam, S. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.

- Meyerson, D., Weick, K., & Kramer, R. (1996). Swift trust in temporary groups. In R. Kramer & T. Tyler (Eds.), *Trust in organizations: Frontiers of theory and research* (pp. 165-195). Thousand Oaks, CA: Sage.
- Millikin, J., Horn, P., & Manz, C. (2010). Self-management competencies in self-managing teams: Their impact on multi-team system productivity. *The Leadership Quarterly*, 21(5), 687-702.
- Mills, K. (2011). Shared leadership. *Brw*, 33(23), 26-27.
- Northouse, P. (2010). *Leadership: Theory and practice* (5th ed). Thousand Oaks, CA: Sage Publications.
- O'Connell, M., Doverspike, D., & Cober, A. (2002). Leadership and semiautonomous work team performance: A field study. *Group & Organization Management*, 27(1), 50.
- Pearce, C. (1997). *The determinants of change management team (CMT) effectiveness: A longitudinal investigation* (Unpublished doctoral dissertation). University of Maryland, College Park.
- Pearce, C. (2004). The future of leadership: Combining vertical and shared leadership to transform knowledge work. *Academy of Management Executive*, 18(1), 47-57.
- Pearce, C., & Conger, J. (Eds.). (2003). *Shared leadership: Reframing the hows and whys of leadership*. Thousand Oaks, CA: Sage.
- Pearce, C., Conger, J., & Locke, E. (2008). Shared leadership theory. *The Leadership Quarterly*, 19(5), 622-628.
- Pearce, C., & Herbig, P. (2004). Citizenship behavior at the team level of analysis: The effects of team leadership, team commitment, perceived team support, and team size. *Journal of Social Psychology*, 144(3), 293-310.
- Pearce, C., Hoch, J., Jeppesen, H., & Wegge, J. (2010). New forms of management: Shared and distributed leadership in organizations. *Journal of Personnel Psychology*, 9(4), 151-153.
- Pearce, C., Manz, C., & Sims, H. (2008). The roles of vertical and shared leadership in the enactment of executive corruption: Implications for research and practice. *The Leadership Quarterly*, 19(3), 353-359.
- Pearce, C., Manz, C., & Sims, H. (2009). Where do we go from here?: Is shared leadership the key to team success? *Organizational Dynamics*, 38(3), 234-238.

- Pearce, C., & Sims, H. (2002). Vertical versus shared leadership as predictors of the effectiveness of change management teams: An examination of aversive, directive, transactional, transformational, and empowering leader behaviors. *Group Dynamics: Theory, Research, and Practice*, 6(2), 172-197.
- Pearce, C., Yoo, Y., & Alavi, M. (2004). Leadership, social work, and virtual teams: The relative influence of vertical versus shared leadership in the nonprofit sector. In R. Riggio & S. Smith Orr (Eds.), *Improving leadership in nonprofit organizations* (pp. 160-203). San Francisco, CA: Jossey-Bass.
- Perry, M., Pearce, C., & Sims, H. (1999). Empowered selling teams: How shared leadership can contribute to selling team outcomes. *Journal of Personal Selling & Sales Management*, 19(3), 35-51.
- Pfeffer, J., & Salancik, G. (1978). *The external control of organizations: A resource dependence perspective*. New York: Harper & Row.
- Pitts, D. (2005). Diversity, representation, and performance: Evidence about race and ethnicity in public organizations. *Journal of Public Administration Research and Theory*, 15(4), 615-631.
- Ramthun, A. (2012, March). *Shared leadership in dangerous environments*. Paper presented at Western Academy of Management Annual Meeting, La Jolla, CA.
- Ramthun, A., & Matkin, G. (2012). Multicultural shared leadership: A conceptual model of shared leadership in culturally diverse teams. *Journal of Leadership & Organizational Studies*, 19(3), 303-314.
- Ramthun, A., & McElravy, L. (2012, October). *Boundary conditions and measurements for shared leadership in teams: Investigating dangerous environments, social power distribution, and social network analysis*. Paper presented at Midwest Academy of Management Annual Meeting, Chicago, IL.
- Scott, J. (2000). *Social network analysis: A handbook*. Los Angeles, CA: Sage.
- Seeger, M., Sellnow, T., & Ulmer, R. (2003). *Communication and organizational crisis*. Westport, CT: Praeger.
- Shamir, B., & Lapidot, Y. (2003). Shared leadership in the management of group boundaries. In C. Pearce & J. Conger (Eds.), *Shared leadership: Reframing the hows and whys of leadership* (pp. 235-249). Thousand Oaks, CA: Sage.
- Sivasubramaniam, N., Murry, W., Avolio, B., & Jung, D. (2002). A longitudinal model of the effect of team leadership and group potency on group performance. *Group & Organization Management*, 27(1), 66-96.

- Small, E., & Rentsch, J. (2010). Shared leadership in teams: A matter of distribution. *Journal of Personnel Psychology*, 9(4), 203-211.
- Solansky, S. (2008). Leadership style and team processes in self-managed teams. *Journal of Leadership & Organizational Studies*, 14(4), 332-341.
- Sparrowe, R., Liden, R., Wayne, S., & Kraimer, M. (2001). Social networks and the performance of individuals and groups. *Academy of Management Journal*, 44(2), 316-325.
- Sweeney, P., Matthews, M., & Lester, P. (Eds.). (2011). *Leadership in dangerous situations: A handbook for the armed forces, emergency services, and first responders*. Annapolis, MD: Naval Institute Press.
- United States Army. (2006). *FM 6-22: Army leadership: Competent, confident, and agile*. Washington, DC: Department of the Army
- United States Marine Corps. (1996). *Command and control*. Retrieved from http://www.dtic.mil/doctrine/jel/service_pubs/mcdp6.pdf
- United States Marine Corps. (1997a). *Tactics*. Retrieved from <http://www.usmc.mil/news/publications/Documents/MCDP%201-3%20Tactics.pdf>
- United States Marine Corps. (1997b). *Warfighting*. Retrieved from http://www.dtic.mil/doctrine/jel/service_pubs/mcdp1.pdf
- Waldman, D., Ramirez, G., House, R., & Puranam, P. (2001). Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty. *Academy of Management Journal*, 44(1), 134-143.
- Weick, K., & Sutcliffe, K. (2007). *Managing the unexpected: Resilient performance in an age of uncertainty*. San Francisco, CA: Jossey-Bass.
- Yammarino, F., Mumford, M., Connelly, M., & Dionne, S. (2010). Leadership and team dynamics for dangerous military contexts. *Military Psychology*, 22(Suppl. 1), S15-S41.
- Yukl, G. (2010). *Leadership in organizations* (7th ed.). Upper Saddle River, NJ: Prentice Hall.

Appendix A

Quantitative Survey and Qualitative Response Questions

Team number: _____

Team member number (circle your number):

1

2

3

4

Please answer the following questions using the bubble form provided. Please note that the scales will change for different sections of the survey. There are a few questions where you will write your answers on the form, please do so.

Please complete the demographic information provided on the bubble sheet as follows.

Name:

In the first column, please fill in your number.

A=team member 1

B=team member 2

C=team member 3

D=team member 4

Sex: M=Male F=Female

Grade or Education:

Please select only one of the following answers.

0=no education

1=Completed grade 6 (elementary school)

2=Completed grade 8 (middle school)

3=Completed grade 12 (graduated high school)

4=Completed one year of post-secondary school (eg. college, university, technical/trade school)

5=Completed two years of post-secondary school (eg. college, university, technical/trade school) or completed Associates Degree

6=Completed three years of post-secondary school (eg. college, university, technical/trade school)

7=Completed bachelor's degree (eg. B.A., B.S.)

8=Completed one year of post-graduate work (eg. post-bachelors, MBA, M.A., M.S.)

9=Completed master's degree (eg. MBA, M.A., M.S.)

10=Completed at least 1 year of doctoral or professional education (eg. M.D., J.D., Ph.D)

11=Completed doctoral or professional education (eg. M.D., J.D., Ph.D.)

Birthdate:

Please fill in your birthdate.

Identification Number:

- A. Which best describes your ethnicity?
 0. American Indian or Alaska Native
 1. Asian
 2. Black or African American
 3. Native Hawaiian or Other Pacific Islander
 4. White/Caucasian
 5. Other

- B. Which military service do you currently belong to?
 0. Air Force
 1. Army
 2. Marine Corps
 3. Navy
 4. Coast Guard

- C. Which best describes your current military status or program of enrollment?
 0. Enlisted (Active/Reserve/Guard)
 1. Officer (Active/Reserve/Guard)
 2. ROTC (At any undergraduate institution)
 3. Other military officer commissioning program (Academy, PLC, OCC, OCS, etc.)

- D. Regardless to your answer to question C, are you currently or did you previously serve as an enlisted person or officer (Active/Reserve/Guard)?
 0. Yes
 1. No

- E. How many years have you served in combat as a military member (Active/Reserve/Guard)?
 0. Never served in combat as a military member
 1. Served in combat as a military member, but not more than one year
 2. Served in combat as a military member, but not more than two years
 3. Served in combat as a military member, but not more than three years
 4. Served in combat as a military member, but not more than four year s
 5. Served more than four years in combat as a military member

F. Through J: Leave Blank

Special Codes

Please fill in your team's number.

Team number: _____

Team member number (circle your number):

1

2

3

4

In the space below, please provide a definition of leadership.

I think leadership is....

Answer the following questions about team member ONE:

1. To what degree did your team rely on this individual for leadership?
 - A. Not at all.
 - B. Between not at all and to some extent.
 - C. To some extent.
 - D. Between some extent and a very great extent.
 - E. Very great extent.
 - F. I am team member one

2. To what degree did you rely on this individual for leadership?
 - A. Not at all.
 - B. Between not at all and to some extent.
 - C. To some extent.
 - D. Between some extent and a very great extent.
 - E. Very great extent.
 - F. I am team member one.

Please provide examples of this person's leadership or lack of leadership during the scenario.

This person was or was not a leader because...

Team number: _____

Team member number (circle your number):

1

2

3

4

Answer the following questions about team member TWO:

3. To what degree did your team rely on this individual for leadership?
 - A. Not at all.
 - B. Between not at all and to some extent.
 - C. To some extent.
 - D. Between some extent and a very great extent.
 - E. Very great extent.
 - F. I am team member Two.
4. To what degree did you rely on this individual for leadership?
 - A. Not at all.
 - B. Between not at all and to some extent.
 - C. To some extent.
 - D. Between some extent and a very great extent.
 - E. Very great extent.
 - F. I am team member Two.

Please provide examples of this person's leadership or lack of leadership during the scenario.

This person was or was not a leader because...

Team number: _____

Team member number (circle your number):

1

2

3

4

Answer the following questions about team member THREE:

5. To what degree did your team rely on this individual for leadership?
 - A. Not at all.
 - B. Between not at all and to some extent.
 - C. To some extent.
 - D. Between some extent and a very great extent.
 - E. Very great extent.
 - F. I am team member Three.

6. To what degree did you rely on this individual for leadership?
 - A. Not at all.
 - B. Between not at all and to some extent.
 - C. To some extent.
 - D. Between some extent and a very great extent.
 - E. Very great extent.
 - F. I am team member Three.

Please provide examples of this person's leadership or lack of leadership during the scenario.

This person was or was not a leader because...

Team number: _____

Team member number (circle your number):

1

2

3

4

Answer the following questions about team member FOUR:

7. To what degree did your team rely on this individual for leadership?
- A. Not at all.
 - B. Between not at all and to some extent.
 - C. To some extent.
 - D. Between some extent and a very great extent.
 - E. Very great extent.
 - F. I am team member Four.
8. To what degree did you rely on this individual for leadership?
- A. Not at all.
 - B. Between not at all and to some extent.
 - C. To some extent.
 - D. Between some extent and a very great extent.
 - E. Very great extent.
 - F. I am team member Four.

Please provide examples of this person's leadership or lack of leadership during the scenario.

This person was or was not a leader because...

Thank you for completing this survey. If you have any questions about this study, please contact any of the researchers.

Please turn in your bubble sheet and your survey packet to the researcher.

Appendix B

Team Performance Scale

Date_____ Time_____ Team #_____

1. How much time was required for the team to complete the scenario?

_____ (Minutes)

2. How many civilian casualties did the team inflict?

_____ (injury or death)

3. How many friendly force casualties did the team inflict?

_____ (injury or death)

4. How many team members were extracted before time expired?

_____ (1, 2, 3, 4)

5. Rate the team's effectiveness in neutralizing the enemy threat on the following continuum ("X").

_____ 1. No effect.

_____ 2.

_____ 3. Somewhat effective

_____ 4.

_____ 5. Highly effective.

6. Rate the team's adherence to the scenario's rules of engagement on the following continuum ("X").

_____ 1. No adherence.

_____ 2.

_____ 3. Some adherence.

_____ 4.

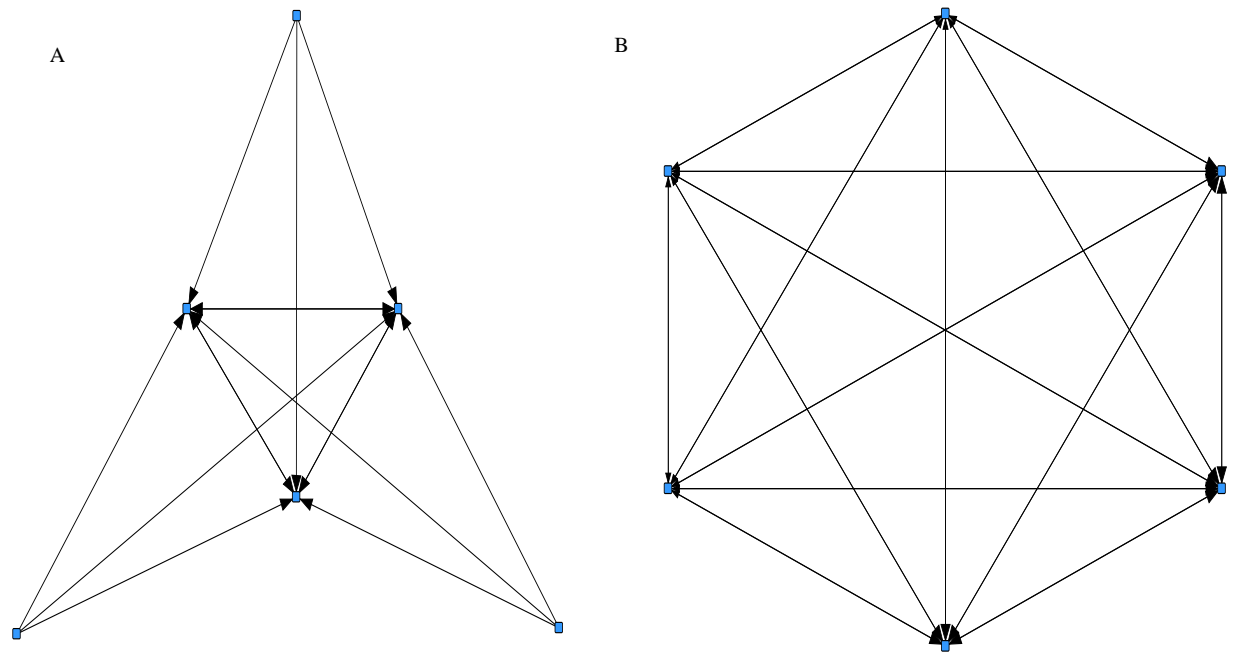
_____5. Strict adherence.

7. Did the team get the map to the extraction point?

_____Yes

_____No

FIGURE 1
Example Leadership Network Sociograms



^A High centralization (only 3 nodes were nominated as leaders).

^B Complete decentralization (no centralization; all nodes were equally nominated as leaders).

TABLE 1
Centralized and Decentralized Networks With
Measures of Density and Centralization

	Density	Centralization (Indegree ^a)
Centralized Network	3	48.00%
Decentralized Network	3	0

^a Indegree refers to nominations received

TABLE 2
Descriptive Statistics and Correlations^a

Variable	Mean	s.d.	1	2	3	4	5	6
1. Shared Leadership (Density)	3.13	0.68						
2. Shared Leadership (Centralization)	31.79	14.95	-.48***					
3. Shared Leadership (Density * Centralization)	94.90	14.95	-.08	.90***				
4. Team Performance	26.58	5.97	.63***	-.22	.07			
5. Team Combat Experience	1.71	1.67	.48***	-.25*	-.09	.57***		
6. Team Racial Diversity	0.38	0.26	-.03	.34**	.32*	-.06	.32**	
7. Team Gender Diversity	0.16	0.19	-.46***	.33**	.12	-.42**	-.15	.06

^a $n = 51$ teams

* $p < .05$, ** $p < .01$, *** $p < .001$

TABLE 3
Summary of Regression Analysis for Hypothesis 1^a

Variable	Team Performance			
	B	SE B	β	<i>t</i>
Shared Leadership (Density)	3.13	1.23	.33*	2.56
Team Combat Experience	1.57	.44	.44***	3.56
Team Racial Diversity	-3.90	2.30	-.17	-1.62
Team Gender Diversity	-5.60	3.37	-.19	-1.66

^a $n = 51$ teams

* $p < .05$, ** $p < .01$, *** $p < .001$

TABLE 4
Summary of Regression Analysis for Hypothesis 2^a

Variable	Team Performance			
	B	SE B	β	<i>t</i>
Shared Leadership (Centralization)	.06	.05	.16	1.23
Team Combat Experience	2.31	.43	.65***	5.35
Team Racial Diversity	-6.54	2.78	-.29*	-2.35
Team Gender Diversity	-10.49	3.33	-.35**	-3.16

^a *n* = 51 teams

p* < .05, *p* < .01, ****p* < .001

TABLE 5
Summary of Regression Analysis for Hypothesis 3^a

Variable	Team Performance			
	B	SE B	β	<i>t</i>
Shared Leadership (Density)	2.25	2.43	.24	.93
Shared Leadership (Centralization)	-.07	.23	-.18	-.32
Shared Leadership (Density * Centralization)	.06	.08	.40	.81
Team Combat Experience	1.77	.43	.49***	4.10
Team Racial Diversity	-5.71	2.63	-.26*	-2.17
Team Gender Diversity	-6.09	3.45	-.20	-1.82

^a *n* = 51 teams

p* < .05, *p* < .01, ****p* < .001

TABLE 6
Summary of the Stepwise Regression Analysis^a

Variable	Team Performance					
	Model 1			Model 2		
	B	SE B	β	B	SE B	β
Shared Leadership (Density)	5.99	1.06	.63***	4.41	1.20	.46***
Team Combat Experience				1.24	.42	.35**
R^2			.40***			.49***
ΔR^2			.40***			.09***
F for ΔR^2		32.09			8.65	

^a $n = 51$ teams

* $p < .05$, ** $p < .01$, *** $p < .001$

TABLE 7
Codes and Themes for Qualitative Phase I

Initial Codes	Final Codes	Themes
Change	Common Goals	Common Goals*
Common Goals/Objectives/Mission	Emergence	Follower Awareness+
Context	Followers Knowledge/Awareness	Influence*
Decisive Action	Providing Guidance	Process*
Emergence	Providing Influence	Situational Awareness+
Experience	Providing Inspiration	
Focusing Effort	Providing Motivation	
Followers Knowledge/Awareness	Providing Direction	
Initiated Communication	Relationships	
Interpersonal Relations	Situational Knowledge/Awareness	
Maintaining Accountability		
Providing an Example for Others		
Providing Direction		
Providing Guidance		
Providing Influence		
Providing Inspiration		
Providing Motivation		
Relationships		
Situational Knowledge/Awareness		
Stimulating Interaction/Teamwork		
Taking Command/Charge		
Team/Group		
Time		
Trust		

Note : * = Primary Theme, + = Supporting Theme

CHAPTER IV:

Article 3

Dangerous Dynamism: A Case Study of Experts' Perspectives on
Shared Leadership in Dangerous Environments

A. J. Ramthun and Gina S. Matkin

University of Nebraska-Lincoln

Department of Agricultural Leadership, Education, and Communication

Manuscript to be submitted for the

Midwest Academy of Management Annual Meeting 2013

Abstract

In a qualitative case study, we described and explained the phenomenon of shared leadership in military teams operating in dangerous contexts. We interviewed eight shared leadership, team, and military leadership subject matter experts to describe shared leadership in dangerous environments. We found the themes of mutual influence, leadership emergence, dangerous dynamism, and distributed knowledge, skills, and abilities (KSA) provide rich description of the phenomenon. Implication, limits, and recommendations are discussed.

Keywords: shared leadership, dangerous context, qualitative

Dangerous Dynamism: A Case Study of Experts' Perspectives on Shared Leadership in Dangerous Environments

Leadership and management scholars have increasingly investigated new and hybrid forms of leadership in teams (Day, Gronn, & Salas, 2004, 2006). Of these new team research streams, the phenomenon of shared leadership has received significant scholarly attention (Pearce, Hoch, Jeppesen, & Wegge, 2010). Defined as a, “Dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both” (Pearce & Conger, 2003, p. 1), shared leadership offers teams an alternative model to traditional forms of vertical leadership. Though positively predicting performance in conventional contexts (Carson, Tesluk, & Marrone, 2007; Pearce & Sims, 2002), scholars have yet to examine shared leadership in extreme or dangerous contexts where “Leaders or their followers are personally faced with highly dynamic and unpredictable situations and where the outcomes of leadership may result in severe physical or psychological injury (or death) to unit members” (Campbell, Hannah, & Matthews, 2010, p. S3). The lack of scholarly understanding of shared leadership in dangerous environments highlights an important gap in team leadership research

This investigation qualitatively addresses the central phenomenon of shared leadership in military teams operating in dangerous environments through a case study design. Using recent empirical results showing shared leadership’s strong relationship to team performance in dangerous contexts (Ramthun, McElravy, & Matkin, 2013) to develop the qualitative protocol, we conducted eight semi-structured interviews with subject matter experts in the areas of shared leadership, military teams, and dangerous

environments. Following data collection and analysis, we found two primary and two supporting themes describing and explaining the central phenomenon. Finally, we addressed theoretical and practical implications, limitations, and recommendations for future directions of research.

Research Question

How do subject matter experts describe and explain shared leadership in dangerous environments for military combat teams?

Method

Qualitative Approach Rationale

Describing and developing an understanding of shared leadership for military teams in dangerous environments represents the primary purpose of this study. This objective seeks to find and paint a valid and holistic picture of people's interpretations and perceptions of shared leadership. To achieve this interpretative objective, the researcher needs to capture the significance team members obtain from native context (Denzin & Lincoln, 2005). Qualitative methods offer effective approaches for addressing research problems investigating the meaning people derive from social or human context (Creswell, 2007). Qualitative research results provide rich, deep, and real description, answering research problems requiring understanding vice prediction (Stainbeck & Stainbeck, 1988). Additionally, qualitative research approaches provide appropriate methods for exploring the nature of a phenomenon with relatively little information (Hatch, 2002; Merriam, 2009). With this study's purpose requiring description and understanding rather than correlation or control and the lack of previous research on the

central phenomenon in high velocity context, qualitative methods offer the most appropriate approaches to properly address the research problems.

Tradition of Inquiry

This research employs the case study qualitative tradition of inquiry in order to achieve its objective. Merriam (2009) has defined a case study as, “An in-depth description and analysis of a bounded system” (p. 40). The primary outputs of case studies are case-based themes and description (Creswell, 2007; Merriam, 2009). To be a valid case study, the central phenomenon must be intrinsically and clearly bounded (Creswell, 2007). Additionally, the unit of analysis characterizes the nature of the case study (Hatch, 2002). Rather than focusing on the research topic, the case study method investigates specific instances by which the topic may be bounded. The case study approach also enables researchers to describe and illuminate a phenomenon found in complex social units with little previous investigation (Merriam, 2009). Specific instances offer opportunities for rich description of the central phenomenon in areas lacking previous investigation. Finally, case studies represent effective approaches to richly describe a phenomenon in real-life context (Merriam, 2009). Gathering extensive data from multiple sources within the unit of analysis provides an in-depth, real-life view of the case (Creswell, 2007).

The case study approach represents an appropriate method for this research project. Describing and explaining shared leadership for military teams in dangerous environments represents the primary purpose of this study. The unit of analysis of this study is US military personnel operating in four-person-sized combat teams. The unit of analysis provides an instance and context lacking previous research to bind the topic.

The case study approach also provides the researcher with the ability to build richly descriptive results, addressing the research questions in a real-life context.

Sample

Since qualitative methods do not seek to provide generalizable results (Merriam, 2009), this phase of the study employed nonprobability sampling methods. Seeking to build rich, informational descriptions within this phase's results, we purposefully sampled individuals using both reputational-case (Schumacher & McMillian, 1993) and chain or snowball sampling method (Patton, 2002). With few previous studies investigating the central phenomenon of shared leadership in dangerous environments, the researcher began the reputational-chain sample by establishing participant selection criteria designed to draw data from experts in the unit of analysis.

First, we decided to solicit participants from leadership scholars possessing subject matter expert knowledge of shared leadership. Using the Google Scholar website, we searched for shared leadership and team theoretical, empirical, and practitioner related books, book chapters, conference papers, conference proceedings, and articles; we bounded the search from the year 2000 (beginning the era of shared leadership study) to the present in order to avoid false positive content and ensure the scholars were still available to solicit participation. We found a total of 89 independent items related to teams and shared leadership. From the pool of authors of these articles, we developed reputational selection criteria for individuals with greater than four published works on shared leadership. Second, we decided to solicit participants from military leadership practitioners holding subject matter expert knowledge of teams regularly operating in dangerous contexts. We developed a reputation selection criteria based on possessing

combat experience (greater than one combat deployment), team leadership experience (greater than 2 years of experience), and combat instructor qualifications (greater than one specialty-specific instructor qualification).

Using the shared leadership scholar selection criteria, we found six potential participants. We submitted a prefabricated participation request email, along with a copy of our IRB-approved informed consent letter and interview protocol, to the six potential participants; once an individual agreed to participate, we sent them a copy of the results from Ramthun et al. (2013) for review. We initially received two responses from scholars agreeing, one response from a scholar regretting the invitation due to other priorities, and three nonresponses. With a target of at least four total shared leadership scholar participants, we asked the two willing participants to provide us with reputable referrals to locate and solicit other experts. Each of these participants referred us to four other scholars; from these referrals, only two met our selection criteria. Upon contacting the referrals, both agreed to participate in the study. The snowball or chain effect of the reputable referrals enabled us to quickly find experts meeting the selection criteria to participate in the study. After the fourth interview was completed, we determined enough data was available to conduct a proper analysis.

Using the military team leadership subject matter expert selection criteria, we found one potential participant acting as a military officer instructor at a large, southeastern US university. After receiving our prefabricated participation request email, along with a copy of our IRB-approved informed consent letter and interview protocol, he agreed to be interviewed for the study; as with the scholars, we sent the results from Ramthun et al. (2013) to individuals upon their agreement to participate. With a target of

at least four total military team leadership subject matter expert participants, we asked our lone participant to provide us with reputable referrals to conduct additional interviews. The participant provided five referrals to other subject matter experts; from these referrals, all of them met our selection criteria. Upon contacting the referrals, three agreed to participate in the study and two did not respond to our requests. Similar to the shared leadership snowball effect of the reputable referrals, the same process enabled us to find enough subject matter experts meeting the selection criteria to participate in the study. After we completed the fourth interview, we concluded enough data was available to conduct a proper analysis.

Data Collection Strategy

The study employed the formal interview method (Hatch, 2002) to collect interview data. The formal interview method used a semistructured design (see interview protocol and questions in the Appendix of this article) in order to maximize the use of probes and follow-up questions, providing flexibility to the researcher and drawing out in-depth data (Merriam, 2009). Each interview was conducted via telephone, with the researchers and participants in a private setting, using an interview instrument with prefabricated questions designed to capture rich description of the phenomenon. The interviews were 1 hour in length, included written research notes on each printed protocol, and were digitally voice recorded. The interview protocol's primary or probing questions were structured to draw out rich description from each participant. Follow-up questions were designed to gather additional meaning from responses to the probing questions. The semistructured follow-up questions also set flexible conditions for additional and unplanned questions to draw greater meaning from unanticipated

responses. The researcher reviewed previous interview notes in order to develop additional questions for future interviews in an effort to focus the interview process after each event.

Analysis

Organization and exploration. This study employed a simultaneous data collection and analysis strategy (Merriam, 2009). As the interviews were individually completed, the researcher conducted rudimentary analyses in order to narrow the focus prior to final analysis, develop improved analytic questions, and test emerging themes on participants (Bogdan & Biklen, 2007). Hatch (2002) has argued, “Data analysis is a systematic search for meaning” (p. 148). Once the researcher completed the data collection phase, the raw data was organized in order to facilitate a systematic interrogation to discover patterns, ideas, and themes; all interview data were transcribed from verbal digital recordings into computer type documents. Each set of data was printed off to support shorthand designation process coding. With these tasks complete, we conducted a preliminary exploratory analysis (Creswell, 2008) to obtain a general sense of the data’s content and direction. The preliminary exploratory analysis provided the researcher general orientation to data trends and confirmation of the presence of enough data to continue the analysis.

Codes and themes. The researcher employed a typological (Hatch, 2002) hand-analysis data coding method (Creswell, 2008) for this project. The typological element of the method requires researchers to divide data sets into groups using typological categories in order to find patterns and develop themes (Hatch, 2002). Unlike computer programs that automatically store, analyze, and make sense of the data, the hand-analysis

element of the method requires scholars to manually develop typological categories, read the data, color code the text, and derive themes (Creswell, 2008). Computer analysis is convenient for ultra-large amounts of data; due to the small data pool and our high proficiency for manual coding, we elected to employ the hand-analysis method.

<Insert Table 1 about here>

The primary goal of the typological hand analysis was to make sense of the data through the discovery of themes (Creswell, 2007). These types of findings enable the researcher to answer the original research questions and develop a strong understanding of the central phenomenon (Creswell, 2008). Since qualitative data analysis is primarily inductive and comparative (Merriam, 2009), this project's analytical process included organizing, consolidating, coding, comparing, reducing, and interpreting data to form descriptive findings. The preliminary exploratory analysis phase enabled us to complete data organization and consolidation. During coding, we identified text segments within the data, assigning code words describing the meaning of each segment (Creswell, 2008); the initial coding effort found 32 total code words. These were compared for overlapping trends in meaning and redundancy; this reduced the total number of codes to 10. We reviewed for a final time, finding four total themes (two primary and two supporting) describing the central phenomenon and answering research questions (see Table 1). The meaning from each theme was interpreted and described within the results section of the project.

Verification procedures. The themes were subjected to two verification procedures following the completion of the analytic process designed to validate the findings: member checking and peer review. First, we employed member checking to

ensure the accuracy of our findings. By providing the preliminary analysis to the participants, we received valuable feedback on our interpretation of the data and results, ensuring accuracy of the rich description (Creswell, 2007; Merriam, 2009). We provided all transcripts to each participant to verify all statements were transcribed and qualified properly. Additionally, the researcher supplied the participants with preliminary findings of this phase of the study. Of the eight participants, we received six responses providing feedback that the content was valid and accurate; two participants did not respond to our member checking request. Finally, the themes were subjected to verification by the procedure of peer review, designed to validate the findings. Three total business management and agriculture leadership doctoral students with knowledge of shared leadership examined the study's themes, inferences, and credibility. The peer reviews provided objective feedback used by the researcher to improve the framework and structure of the paper. The use of these three verification procedures ensures the project's findings "match reality" (Merriam, 2009, p. 213). We did not employ triangulation in this phase of the study. This was due to a lack of additional observations and artifacts required for triangulation and review by participants (Creswell, 2007; Merriam, 2009).

Results

Participant information.

Participant 1. Serving as the president of a learning and leadership consulting firm, this participant maintains a strong reputation as the top scholar of shared leadership within the field of study. With a number of publications exceeding 25 articles on team and shared leadership dynamics, his profile well exceeded our selection criteria. He

currently provides consulting services, with an emphasis on teams and shared leadership, to top business organizations located around the world. The contexts of his contributions to the study are highly relevant due to his significant scholarly knowledge of the central phenomenon.

Participant 2. Serving as a business school faculty member at a large, southern US university, this individual strongly met the selection criteria. He completed eight shared leadership and team publications, with two appearing in the top journals from the field of study. He also used the social network analysis approach to measuring shared leadership in his work. The contexts of his contributions to the study are relevant due to his scholarly credibility within the context of shared leadership.

Participant 3. Serving as a psychology faculty member at a large, southeastern US university, this individual strongly met the selection criteria. He published in excess of 20 team leadership and performance articles, with many involving military and dangerous contexts. He also is a leader in the field of military simulation training and performance evaluation, conducting training for elite elements of the US Navy under grants and contracts. The contexts of his contributions to the study are relevant due to his vast experience studying and evaluating team performance in military contexts.

Participant 4. Serving as a business school faculty member at a large, northeastern US university, this individual strongly exceeded the selection criteria. He published in excess of 10 articles on self-managed teams, shared leadership, and team leadership. He has also published leadership education books for the US Naval Academy. The contexts of his contributions to the study are relevant due to his scholarly achievements within the context of team and military leadership.

Participant 5. Serving as an active duty officer in the US Marine Corps, this individual well exceeded the selection criteria. An AV-8B Harrier jet pilot, he has obtained every flight qualification the community has to offer; this feat is rare due to challenges of timing and mastering multiple skill sets. In addition to amassing over 1,500 flight hours, he has participated in four different combat deployments (two in Iraq and two in Afghanistan). Currently serving as a flight instructor teaching new aircrew how to fly AV-8B Harriers, his squadron environment is grounded in teaching the basics of close air support and flight leadership. The contexts of his contributions to the study are relevant due to his vast leadership experience in dangerous contexts as a military pilot and his role as an instructor of new pilots.

Participant 6. Also serving as an active duty officer in the US Marine Corps, this individual met the selection criteria. The participant served as an artillery officer for 4 years prior to being selected for duty as an AH-1W Cobra attack helicopter pilot and later as a lead instructor at the Marine Corps Officer Candidates School (OCS). In addition to amassing over 1,000 flight hours, he has participated in three different combat deployments (two with artillery in Iraq and one as a pilot in Afghanistan). He currently serves as a company commander at Marine Corps OCS, with a focus on training and selecting young men and women for Marine Corps careers as leaders and officers. The contexts of his inputs to the study are pertinent due to his wide variety of career experiences in combat, his leadership instructor credibility, and his overall experience as a military leader.

Participant 7. Serving as a US Navy SEAL (Sea, Air & Land) officer and special operator, this participant meets selection criteria. Due to the clandestine nature of his

work, he requested we not list the details of his extensive combat experience and SEAL-specific instructor qualifications. He currently serves as a student at the US Naval War College in Newport, Rhode Island. The contexts of his responses for the study are valuable due to his overall combat experience within the special operation forces (SOF) community and leadership experience with teams.

Participant 8. Serving as a Staff Sergeant in the US Marine Corps, this participant also meets selection criteria. He served as an enlisted team leader at multiple levels during two combat deployments in Iraq and Afghanistan. He currently serves as a team leadership instructor at the Marine Corps School of Infantry (SOI) East at Camp Geiger, North Carolina. The contexts of his participation to the study are relevant due to his team leadership, combat, and instructor experience.

Primary Themes.

Mutual influence. The participants richly described the important impact of mutual influence on the performance of teams in dangerous environments. Participant 1 explained mutual influence as:

Beyond mere role playing within teams. Rather, you would see this in your military teams when team members step forward and provide leadership when their experience, knowledge, and overall strengths are required and leading themselves to step down and enable other team members to lead when their abilities are needed in the dangerous situation. For the team members, you must to know “when to lead and when to get out of the way,” as they say.

Participant 5 provided a real-life military aviation team example of this phenomenon in action:

I was a wingman this time and we checked in over Musa Qalah to help out the Brits. While my flight lead was talking to the guys on the ground, I witnessed a truck with a large mortar tube pull within range of their position. I immediately took charge of the situation...I kicked my lead off

of the radio and gave the Brits a direction and distance for the vehicle from their position. My lead now transferred tactical responsibility of the situation over to me until we eliminated the threat or another situation rose up where I did not have the awareness or ability to be in the lead.

Participant 2 explained, “Shared leadership, as a construct, is a process of mutual influence.” Additionally, he assessed, “Your study found that mutual influence was stronger than individual influence. It is fair to say these teams did not over-rely on one individual to ensure the performance of their team...they were stewards of the shared leadership process.”

Participant 3 commented on the impact mutual influence played in the context of our study:

In your scenarios, mutual influence probably built strength across the entire team, not only in the best application of the team members’ abilities, but in mitigating the high degree of vulnerability military teams face, such as the loss of the team leader within the team process due to an lost communications, injury, or possibly death. So teams relying on mono-influence from the team leader may be more apt to fail when their leader is no longer able or available to provide influence.

Participant 7 further described Participant 3’s comment, stating from his experience that, “Technology seems to fail when you need it. If the team leader goes lost comm, then he is out of the fight. The team members simply recognize this problem and take charge until it is fixed.” Given these descriptions, mutual influence has the potential to enhance the overall capabilities of a team to do more when facing the temporary or permanent loss of their designed leaders.

In Ramthun et al. (2013), we found shared leadership density significantly contributed to team performance. However, we did not find the same for the distribution and interaction measures. This leads to the question: How many should be involved in

the mutual influence process? Participant 2, a social network analysis subject matter expert, explained:

I don't think it is much of a question of "how many people provided influence in a team" as much as it is a question of "did the right people, at the right time, provide mutual influence?" Though another study found shared leadership distribution contributed to team performance, your study did not share the same properties. You know, for example, you guys measured shared leadership during a single event, while their study did it over a long period of time. Who knows if the right relationships developed quickly enough to support broader mutual influence in your research vice the other study? You also got to look at the context here. You guys had a highly dynamic and dangerous scenario, where the other study was more routine, business oriented. This may also play a role in determining the degree of mutual influence to foster performance.

In the case of dangerous context, there may not be enough time for all team members to simultaneously provide influence. Rather, the mutual influence process may be more related to appropriateness of application rather than representing a collective decision-making vehicle, where most or all team members have an influential contribution to an outcome.

Leadership emergence. The participants explained leadership emergence within the team contributed to the high performance of those sharing leadership in dangerous environments. Participant 1 described leadership emergence for shared leadership as, "Involving the serial emergence of both official and unofficial leaders within a team context." In the case of our study, Participant 4 stated, "The emergence of leadership across these teams provided 'leadership sustainability' in the face of difficult and dangerous challenges, allowing them to do more." Participant 7 echoed this assessment, stating, "As a SEAL, you don't ask permission to lead, you just do it in the absence of leadership. My team members play their role and rise above this in the event this situation demands them to do more."

In Ramthun et al. (2013), those teams rating higher on shared leadership (i.e., emergence of unofficial leaders in the team), on average, performed higher than those teams failing to use serial emergence leadership. Participant 5 explained this phenomenon in a real-life event from his military team experience:

We were on an approach into Al Asad airbase and I was flying as the wing. The flight leader was jabbering with the air traffic control guy on final approach when I noticed my flight leader was about to land with his gear up, well, not good and quite dangerous, as you might imagine! I took control of the flight, directing him to waive off and go around to execute a new approach. He didn't understand the problem until I told him to check his gear handle's position. He paused for a moment and replied to my command, "Now I know why you took the lead, thanks for saving our behinds!"

In the case of Participant 5, if he did not emerge to influence his flight leader to waive off the approach, it is likely the situation would result in a deadly mishap. Participant 6 confirmed, "In dangerous situations, the best designated leaders know they may not have all the answers. They support a team culture for others to take the lead until the team leader is able to take it back." In a contrasting team culture, Participant 1 believed a team leader making a mistake may "go unchecked, resulting in a bad situation turning out to be much worse!"

Supporting Themes.

Dangerous dynamism. The military professional participants described their operating environment as dangerously dynamic. Participant 5 emphasized from the beginning of the interview, "Military aviation and ground combat are both highly dangerous and dynamic environments with little forgiveness for poor assumptions, errors, mistakes, and a general lack of leadership." The participants provided examples of the elements, describing and characterizing the context of dangerous dynamism faced by the

teams in Ramthun et al. (2013) as containing uncertainty, increasing risk of death and injury, general potential for danger, instability, rapid and discontinuous change, obsolete information, imperfect information, problematic information, absence of leadership, and distraction. Participant 6 noted military teams operating in dangerously dynamic situations are generally prepared for dynamic contingencies:

Well, our team's pre-mission briefings are focused on addressing contingences such as changes in weather, mission, equipment, weapon systems, threats, enemy activity, friendly movements, airspace availability, communications, leadership location, casualties, and other administrative requirements. We tend place an emphasis on the worst case scenario, drawing on lessons learned from our respective communities. We understand our business is dangerous and tirelessly prepare for this expectation. I mean, our worst nightmare is to be operational and rapidly enter a dangerous situation without having a contingency plan ready for action.

The participants also explained military teams facing threats of danger and change, but only experiencing routine situations, become complacent and show poor performance in the face of dangerous dynamism. Participant 8 argued military teams dynamically transitioning from a routine mission to an unknown mission face the ultimate dangerous challenge:

In combat, for the grunts, many of our contingencies are based on our local operating area, pretty much anywhere we can get to on foot or by vehicle. These are not too large in size, you know, so it is easy to develop pre-mission plans and checklists to get out of trouble faster than you got into it. Stuff like rally points, causality collection points, predetermined airstrike targets, etc. But, when your squad or team was quickly sent on a new mission in an unfamiliar area, many of our original contingency plans go out the window at that point. In this situation of dynamic mission priorities, this is when you see teams acting in the highest elements of danger.

Checklists and pre-deployment training attempt to reduce danger in combat. However, due to changes in the situation on the ground or a lack of communication with the

leaders, military teams in combat may face increasing danger as a mission becomes more dynamic. Participant 1 provided a vignette from a military aviation team perspective to highlight this phenomenon:

So we get overhead the working area and this friendly convoy hits an IED. Boom! We can see it out the cockpit and we know the stuff is about to hit the fan. The convoy leader start working a MEDEVAC request as we search the area for Taliban units looking to take advantage of the situation, you know? Ten minutes goes by and nothing, not a damn thing. Everything is quiet and the chopper is on the way to drag several wounded guys outta there. After the chopper does its thing, the whole convoy begins to be hit by mortars. I keep trying to communicate with the convoy leader, but he rarely responds and is basically overwhelmed by the situation. Just as my wingman thinks he has a location for Taliban team on this mountain, BOOM! The convoy hits two more IEDs after only pulling away 50 meters from the original blast. I don't think their leadership supervised the follow sweet of the area; it's obvious someone forgot or did their job poorly. In the meantime, the possible mortar team has darted away and we finally get a hold of a young soldier claiming the latest IED strike injured the convoy commander. Now no one is in charge at the moment the situation goes from bad to worse, really hard to prepare for a situation like this.

Participant 3 noted military teams face difficult leadership challenges in periods of dangerous dynamism: "We found doing human factors research that as the environment changes and levels of danger become ever present, leaders become distracted, fixated, and in some cases, unable to perform their jobs." This describes the negative impact dangerous dynamism has on team processes and leadership. Participant 1 further explained, "This ever changing, dangerous environment may simply paralyze or prevent the most effective of team leaders from providing influence to the most appropriate people at the most crucial place and time." Participant 7 summarized by stating, "In the end, the difference here between life and death, mission accomplishment and failure, is leadership. If your team lacks the ability to motivate, inspire, adapt, decide, and supervise, then only bad things happen." As a result, leadership emergence

and mutual influence team acts as the catalyst for effective performance. As Participant 7 continued, “Regardless of the team leader’s status, you know, dead, injured, or just plain ineffective, it is on the other team members to pull it together and lead each other to accomplish the mission.” Participant 1 qualified this statement by saying, “That is why in these types of dangerous environments you see teams sharing influence and leadership are more effective than those who act in the absence of influence and leadership.”

Distributed knowledge, skills, and abilities. A supporting theme the scholars and military professionals described as the most effective situations for sharing leadership were in teams with distributed KSAs. Participant 6 described military team members as “not being equal when it comes to skills and general experience.” In the dangerous contexts, Participant 7 stated his SEAL teams shared leadership at times when an individual’s KSAs fit best for addressing the situation. For example, he explained:

In my community, the teams normally have many highly trained and educated operators with expertise multiple disciplines. For example, you know, Mike has lots of training calling in air support. Karl may be a well trained sniper and intelligence processor. Bob has enough combat medical training to earn an MD. Bill’s seven combat deployments make him a walking lessons learned bank. Tom, the officer and team leader, may be right out of training, but has a Naval Academy education. If we get into a dangerous situation, Tom is going to rely on all of us to do more than simply be role players. He will look to each of us, when the time is right, to provide mutual support, guidance, and take charge. See, we are not only are built this way, but we train this way as well.

Participant 4 provided additional insight to this phenomenon from a research perspective:

In a very real sense, shared leadership in teams consists of leadership through mutually influencing self-leaders. This is in contrast to a process in which one person plays a totally static, authoritative role when leading others who are generally expected to simply follow and do nothing else. However, you aren’t going to get to shared leadership if no one else in the team has much to offer in the way of influence. When you have team members with strong skills and experience, the influence process is more fluid and shifts the immediate leadership role, beyond hierarchical position

and authority, as required throughout the process to achieve high performance. In the end, you get more out of your team when the ability to lead is distributed around, especially in a dangerous situation.

Participant 5 explained the pitfalls of sharing leadership with those lacking the potential to lead:

We are all professionals in the air, but some pilots bring more to the fight than others. If I am flying with a strong pilot on my wing, I have no problem passing him the lead when it is clear I am not in a position to make the best decisions for the flight. However, I am not going to do this with everyone in any situation. If my weapon systems are down and the ground guys want a danger close strike, I am not going to let an inexperienced pilot make a terrible mistake based on the conditions of the situation and his experience level. Some pilots, well, I would say, "Make it happen," while others I would be more inclined to do much less.

In this regard, the participants do not describe shared leadership as an all-encompassing leadership solution in dangerous contexts. Rather, they explain the performance of a team may be related to more than simply shared leadership alone. Participant 3 remarked:

You found shared leadership and combat experience both contributed to team performance in your dangerous simulations and this accounted for more variance than shared leadership alone. So you see, having that wider access to essential experience made the teams perform higher than if they were to just share the lead regardless of the team's potential to effectively lead during periods of danger, right?

Thus, the distribution of KSAs among military teams may enhance their performance when attempting to share leadership in dangerous environments. From the perspective of the participants, this appears to be an important key for structuring and training teams to perform highly in dangerous situations.

Discussion

In this study, we qualitatively collected, analyzed, and presented the results from shared leadership, team, and military leadership subject matter expert interviews. We

wanted to learn both what described and explained shared leadership in dangerous environments for military teams. We found the primary themes of mutual influence and leadership emergence, as well as the supporting themes of dangerous dynamism and distributed KSAs, described the subject matter experts' understanding and explanation of shared leadership in dangerous contexts. They viewed shared leadership as centered up mutual influences, provided to team members by the serial emergence of leadership. They also described dangerous dynamism as having a large impact on the team leadership process. Finally, they described teams with widely distributed KSAs to possess the highest potential to maximize the shared leadership process in dangerous environments.

Implications

Our study's results have several implications for the future of shared leadership and dangerous contexts. Our study provides rich description from subject matter experts explaining shared leadership in dangerous environments. The explanations offer valuable insight into the shared leadership influence process under dangerous conditions, an area of study previously left unattended. The results paint an important picture of the shared leadership process in military teams, providing an example or template of context to develop future case studies or empirical research. Additionally, our findings provide valuable descriptions that may be incorporated into practical shared leadership training scenarios for military teams, improving team processes and performance beyond current levels. Finally, our results extend the work of scholars on shared leadership and dangerous contexts and attempts to merge these two areas for further development. Our

work opens the door for future studies to provide new and additional insight for the central phenomenon.

Limitations and Recommendations

Our research does contain limitations requiring engagement in future shared leadership and dangerous studies. We did not employ additional data collection strategies to include observation, artifact review, etc. Multi-collection approaches may contribute to highly valid findings using triangulation to corroborate evidence from different sources, types, or methods of data collection (Merriam, 2009). Future studies may find greater description and explanation by employing multiple data collection strategies in a single study. Additionally, many types of teams outside of the military operate in dangerous contexts (fire, police, aircrew, etc.). However, in our present study, we only investigated the case of military teams. Future studies should examine the case of teams from other areas outside the military to further extend earlier findings.

Conclusion

Our research furthers the field of leadership by providing valuable descriptive results for military teams using shared leadership in dangerous situations. We have set aside the myth of shared leadership in the military and dangerous context as a “pipedream” (Lindsay, Day, & Halpin, 2011) and argue shared influence may provide important value to practitioners. Our investigation describes shared influence in the most dangerous of circumstances, even in matters of life or death. Though our study’s qualitative results highlight new explanations in team, shared leadership, and extreme context research, further investigation is required to provide additional insight and add value to the field of study.

REFERENCES

- Bogdan, R., & Biklen, S. (2007). *Qualitative research for education: An introduction to theories and methods* (5th ed.). Boston, MA: Pearson Education.
- Campbell, D., Hannah, S., & Matthews, M. (2010). Leadership in military and other dangerous contexts: Introduction to the special topic issue. *Military Psychology*, 22(Suppl. 1), S1-S14.
- Carson, J., Tesluk, P., & Marrone, J. (2007). Shared leadership in teams: An investigation of antecedent conditions and performance. *Academy of Management Journal*, 50(5), 1217-1234.
- Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.
- Creswell, J. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle Creek, NJ: Pearson Education.
- Day, D., Gronn, P., & Salas, E. (2004). Leadership capacity in teams. *The Leadership Quarterly*, 15(6), 857-880.
- Day, D., Gronn, P., & Salas, E. (2006). Leadership in team-based organizations: On the threshold of a new era. *The Leadership Quarterly*, 17(3), 211-216.
- Denzin, N. & Lincoln, Y. (eds.). (2005). *The Sage handbook of qualitative research* (3rd Ed.). Thousand Oaks, CA: Sage.
- Hatch, J. (2002). *Doing qualitative research in educational settings*. Albany: State University of New York Press.
- Lindsay, D., Day, D., & Halpin, S. (2011). Shared leadership in the military: Reality, possibility, or pipedream? *Military Psychology*, 23(5), 528-549.
- Merriam, S. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Patton, M. (2002). *Qualitative research and evaluation* (3rd ed.). Thousand Oaks, CA: Sage.
- Pearce, C., & Conger, J. (Eds.). (2003). *Shared leadership: Reframing the hows and whys of leadership*. Thousand Oaks, CA: Sage.

- Pearce, C., Hoch, J., Jeppesen, H., & Wegge, J. (2010). New forms of management: Shared and distributed leadership in organizations. *Journal of Personnel Psychology*, 9(4), 151-153.
- Pearce, C., & Sims, H. (2002). Vertical versus shared leadership as predictors of the effectiveness of change management teams: An examination of aversive, directive, transactional, transformational, and empowering leader behaviors. *Group Dynamics: Theory, Research, and Practice*, 6(2), 172-197.
- Ramthun, A., McElravy, L., and Matkin, G. (2013, March). *Living Dangerously: Shared Leadership and Performance for Teams in Dangerous Environments*. Paper accepted for presentation, Academy of Management Annual Meeting, Orlando, FL.
- Schumacher, S., & McMillian, J. (1993). *Research in education: A conceptual introduction* (3rd ed.). New York: Harper Collins.
- Stainbeck, S., & Stainbeck, W. (1988). *Understanding and conducting qualitative research*. San Francisco: Jossey-Bass.

Appendix

Interview Protocol

Demographic and Administrative Information

Title:

Job Title:

Age:

Professional Experience:

Gender:

Race:

Date of Interview:

Location of Interview:

Introduction

Thank you for speaking with me today. With your permission, I shall record and transcribe (verbatim) this interview, to include all questions, responses, and comments. Following the conclusion of the transcription, I shall provide you with a draft copy for your review in order to ensure I have properly documented the context and meaning of your statements. You shall expect for me to integrate quotations and information from this interview into a final research paper. This paper may be published in a large, academic or professional journal.

This interview aims to collect data describing the results from “Boundary Conditions and Measurements for Shared Leadership in Teams: Investigating Dangerous Environments, Social Power Distribution, and Social Network Analysis.” As a subject matter expert in the field shared leadership, team leadership, and/or military combat, your

input shall prove valuable in achieving this objective. You shall expect me to ask a series of semi structured, open-ended questions in order to illicit descriptive, meaningful responses; these are the same questions I provided you previously in order to prepare your responses for the interview. Please answer each question freely in order to provide as much detail and context. If the questions are unclear, please ask me to clarify and I shall do so. You may end the interview at any time; however, I respectfully request you complete the interview in its entirety in order to maximize the value of your responses. At this are there any questions before we begin the interview?

Questions

1. From the results of the quantitative project, please describe how you believe the participants shared leadership to perform at high levels?
2. From the results of the quantitative project, please describe how you believe the participants failing to employ shared leadership performed at lower levels?
3. Please describe your experiences measuring and analyzing shared leadership data. Do you believe the researchers used the best approach, why or why not?
4. How would have you expected the teams to perform in this type of environment?
Please provide and describe examples.
5. Does combat experience play a major role in the determining team performance? If so, how? Please provide and describe examples.
6. How would you have conducted this quantitative study differently? Please provide and describe examples.
7. Do you think shared leadership has a place in modern military, dangerous contexts?
Why or why not? Please provide and describe examples.

8. Where would you recommend shared leadership be implemented within the military or organizations in dangerous contexts? Please provide and describe examples
9. Where do shared leadership practices already exist in the military and dangerous contexts? Please provide and describe examples.
10. Have you previously experienced shared leadership in practice? If so, in what context? Please describe the process in action and provide examples.

End Interview Protocol

Table 1

Codes and Themes

Initial Codes	Final Codes	Themes
Accurate Information	Danger	Dangerous Dynamism+
Cognitive Demand	Distribution	Distributed Knowledge, Skills, and Abilities+
Danger	Dynamism	Leadership Emergence*
Distraction	Emergence	Mutual Influence*
Distributed Leadership	Empowerment	
Distributed Responsibility	Influence	
Distributed Skills and Abilities	Knowledge, Skills, and Abilities	
Emergence	Leadership	
Empowerment	Mutual Support	
Experience Level	Teams	
Fixation		
Hierarchy		
Influence		
Influence		
Information Prioritization		
Instability		
Knowledge		
Lead Change		
Leadership		
Mutual Support		
Perception		
Qualifications		
Rapid Change		
Relationships		
Risk		
Situational Awareness		
Social Power		
Teams		
Teamwork		
Time		
Trust		
Uncertainty		

Note : * = Primary Theme, + = Supporting Theme

CHAPTER V:
Summary and Conclusion

Summary and Conclusion

This dissertation investigated shared leadership in military teams operating in dangerous environments. Specifically, the research project addressed several gaps in the field of study through the (a) development of a conceptual model of shared leadership in dangerous contexts, (b) testing the relationship between and types of measures for shared leadership and team performance in dangerous environments in a field study, and (c) conducting a qualitative case study investigation of shared leadership in dangerous contexts using subject matter expert interview data. Achieving an strong understanding of the dissertation's central phenomenon represents an increasingly important endeavor. This dissertation, in addition to its academic findings, draws significant attention to this under-investigated area of the field.

Mixed Methods

In additional to the individual contributions of each article from this dissertation, the research project's overall mixed methods design further adds to the study of leadership and management. Mixed methods research uses philosophical assumptions with methods of inquiry to collect, analyze, and mix (merging, embedding, and connecting) qualitative and quantitative data in a single study or over a series of studies in order to more effectively address research problems than a single approach (Creswell & Plano Clark, 2007, 2011). Mixed methods approaches offer management researchers the capability of creatively advancing both leadership theory and practice (Stentz, Plano Clark, & Matkin, 2012). Mixed methods advantages include addressing a simultaneous range of confirmatory and exploratory research questions, stronger inferences, and the application of multiple, divergent research worldviews (Teddle & Tashakkori, 2009).

Recently, Gardner, Lowe, Moss, Mahoney, & Coglisier (2010) and Mumford (2011) have challenged leadership and management scholars to improve research by employing mixed methods approaches. Recent studies—such as Currie, Lockett, and Suhomlinova (2009) and Taylor, Cocklin, Brown, and Wilson-Evered (2011)—represent excellent examples of researchers answering the call of using mixed methods to improve the field’s understanding of complex phenomena (Stentz et al., 2012).

<Insert Figure 1 about here>

Answering the calls of leadership scholars to advance the field using mixed methods (Gardner et al., 2010; Mumford, 2011; Stentz et al., 2012) and due to this dissertation’s research questions exhibiting multiple philosophical paradigms (see Chapter I), we employed a mixed methods approach to better investigate and understand shared leadership in dangerous environments. Specifically, this study employs a two-phase, explanatory sequential mixed methods research design (see Figure 1) to answer our research questions. Explanatory sequential designs enable scholars to collect and analyze quantitative data compartmentally during an initial phase of research and follow up with a second phase of qualitative data collection and analysis; researchers make a final inference after mixing the results of both strands after the end of the second phase (Creswell & Plano Clark, 2011). The results from explanatory sequential designs provide a more complete explanation of quantitative results, both confirming and richly describing initial quantitative findings (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). During explanatory sequential designs, the quantitative strand (QUAN) takes priority over the qualitative strand (qual), leading to the sequential function (QUAN -> qual) of the approach (Creswell & Plano Clark, 2011). In Article II,

we conducted the first-known predictive shared leadership in dangerous environments research project, placing an emphasis on our quantitative data collection, analysis, and results; however, we also wanted to improve our final inferences by confirming and explaining our quantitative results (Phase I) via qualitative data gathered from subject matter experts (Phase II). Thus, the multiphase, explanatory sequential design represented the most appropriate mixed methods approach for us to answer these types of predictive and confirmatory research questions.

In Phase II, we qualitatively collected, analyzed, and presented the results from shared leadership, team, and military leadership subject matter expert interviews. Collecting in sequence following quantitative Phase I, we wanted to learn both how subject matter experts described shared leadership in dangerous environments for military teams and to richly explain and describe our quantitative Phase I results. During Phase II, we found the primary themes of mutual influence and leadership emergence, as well as the supporting themes of dangerous dynamism and distributed KSAs, described the subject matter experts' explanations of shared leadership in dangerous contexts. They viewed shared leadership as centered upon mutual influence, provided to the team through multiple members using the serial emergence of leadership. The experts also described dangerous dynamism as influencing the team leadership process. Finally, they described teams with widely distributed KSAs as attaining high potential to maximize the shared leadership process in dangerous environments.

Reviewing the quantitative Phase I results, the subject matter experts supported and confirmed our original inferences. We initially found shared leadership (density) to have a strong relationship with military team performance in a dangerous environment.

Carson et al. (2007) defines shared leadership as “a team property whereby leadership is distributed among team members rather than focused on a single designated leader” (p. 1217). Pearce and Conger (2003) also define shared leadership as “a dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both,” and “involves peer, or lateral, influence and at other times involves upward or downward hierarchical influence” (p. 1). Similar to these definitions, the subject matter experts supported our results, describing themes of mutual influence and leadership emergence as the factors most likely impacting team performance in our specific context. Additionally, the experts confirmed our lack of support for the centralization and interaction measures of shared leadership, noting the cross-sectional design and context may have played a role in the lack of statistical support. Overall, the use of the explanatory sequential mixed methods design enabled us to strengthen our final results and contribute more to the field of study.

Chapter Findings, Implications, and Summaries

In Chapter II’s article entitled “Highway to the Danger Zone: Investigating Measurements and Boundary Conditions for Shared Leadership in Teams Operating in Dangerous Environments,” we answered the calls of multiple management scholars conceptually explore teams in extreme contexts. Meeting this challenge, we developed a conceptual model of shared leadership in dangerous contexts, contributing to the advancement, study, and practice of leadership in teams. Due to a lack of shared leadership models in dangerous context, the article serves as the first in the field to directly address the topic and stimulate future empirical research. The model further

advances the field by offering new solutions multiple theoretical gaps in dangerous environment, team, and shared leadership research. Future empirical testing of this model may stimulate significant changes in the practices organizations use to select, train, and develop teams working in dangerous contexts. This may enable organizations to increase performance using previously ignored team distributed leadership practices in the most challenging situations.

In Chapter III's article entitled "Living Dangerously: Shared Leadership and Performance for Teams in Dangerous Environments," we addressed important gaps in research, conducting an empirical study of shared leadership in extreme contexts. The quantitative field study represents the first in the field of management to empirically test a model of shared leadership in military teams operating in dangerous context.

Addressing the relationship between shared leadership and team performance in a simulated dangerous environment, our highly representative sample demonstrated military teams operating in an extreme context achieved high performance by sharing influence. This new discovery may begin to paint the shared leadership in military teams as more of a "reality" than a "pipedream" (Lindsay, Day, & Halpin, 2011, p. 548).

Our research has also found the SNA density measure of shared leadership to be a more effective predictor of team performance than centralization or the interaction of density and centralization. Our findings did not support two of our hypotheses regarding centralization or the interaction of density and centralization, and contradicts the results found in Small and Rentsch (2010). Although we did not find support for our hypotheses, the results still provide value to the field of study. Although the extreme context may be one reason for the contradictory results, another key difference between

these two studies was the amount of time participants engaged in the simulations. Participants in Small and Rentsch (2010) were engaged in an 8-week-long simulation, whereas participants in this study were engaged in the simulation for no more than 30 minutes (preparation time and simulation time combined). This may imply a short period of time and in a dynamic dangerous environment, the distribution of leadership may not be as impactful as in a more long-term work environment. Finally, our empirical results confirm and extend a growing body of shared leadership and team performance research.

In Chapter IV's article entitled "Investigating Shared Leadership in Dangerous Environments for Military Teams Using Mixed Methods Research," we conducted a qualitative case study in order to descriptively further the study shared leadership in dangerous contexts. In this article, we collected, analyzed, and presented the results from shared leadership, team, and military leadership subject matter expert semistructured interviews. We wanted to learn both how the subject matter experts described shared leadership in dangerous environments for military teams and to richly explain and describe our quantitative results from article. This qualitative study found the subject matter experts' described shared leadership in dangerous contexts for military teams using the primary themes of mutual influence and leadership emergence, as well as the supporting themes of dangerous dynamism and distributed KSA. The experts viewed shared leadership as grounded in mutual influence and the serial emergence of leadership in military teams. The subject matter experts also explained and described how dangerous dynamism may impact the team leadership process. Finally, they described teams with widely distributed KSAs may possess a high potential to maximize shared leadership in dangerous environments.

Offering practical implications, this dissertation adds more to the field than mere theory and research progression. While the quantitative findings suggest practitioners should consider using shared leadership in dangerous environment as a viable course of action, the qualitative results may suggest military teams have practiced shared leadership for some time. From the experts description of shared leadership in dangerous contexts, some military teams already educate and training their members to shared leadership. However, in other cases, it may appear military teams unknowingly share leadership in order to accomplish their missions in life or death situations. Our empirical findings, coupled with the rich description of the phenomenon in action, it may be more practical for all military teams to receive training and education on shared leadership in order to determine when and how to execute this dynamic influence process. To this end, military teams may have the potential to be even more effective than our research suggests as the embed the lessons learned of shared leadership in practice.

Limitations and Recommendations

The central phenomenon of this dissertation is shared leadership in military teams operating in dangerous contexts. To this end, the articles within this research project fail to address other traditional approaches to team leadership (i.e. full range leadership, leader member exchange, etc.). The studies also neglects the comprehensive examination of other potential moderating and mediating variables, such as varying team size, team member turnover rates, team diversity (i.e. gender and culture), etc. The dissertation also solely examined the case of military teams in dangerous context, leaving out an investigation into other relevant samples, such as fire and rescue, police, commercial airline aircrew, etc. For this dissertation, we were limited in resources and time,

requiring us to focus our efforts into the boundaries of our present investigation. In order to develop more generalizable results and to improve the model in the future, it may be beneficial for researchers to address these additional variables and samples. For our quantitative study, we employed a cross-sectional research design. This has limited our results to simply identifying correlations and relationships. In order to determining causality with our model, future research should address the central phenomenon using strong experimental and longitudinal designs.

For our qualitative study, we failed to use other data collection strategies, such as observation, artifact review, etc. The use of multicollection approaches contribute to highly valid findings through triangulation to corroborate evidence from different sources, types, or methods of data collection (Merriam, 2009). Our decision to use member checking and peer review increased the validity of our results; however, future qualitative studies in this area may develop additional description and explanation by using multiple data collection strategies.

Finally, scholars attempting to extend this dissertation's results may encounter institutional review board (IRB) and field research site challenges. Our quantitative study was dynamic and cutting edge, employing the use of military members in teams using paint marking weapons at an urban fighting training complex. With the mission of IRB to ensure participants are not placed at undue risk, researchers may find it advantageous to conduct studies with teams already conducting normal training in simulated dangerous contexts. This greatly reduces participant risk of physical or psychological injury and increases the likelihood of IRB support. Additionally,

researchers ensuring proper medical and psychological care are available during and after the conclusion of similar studies using extreme scenarios.

Conclusion

As organizations continue to use teams to solve complex problems in dangerous situations and as the potential outcomes inherent to dangerous environments literally spell life or death, an opportunity exists to study and improve those practices stimulating effective team leadership. This dissertation furthers the field of leadership by drawing attention to the value of shared influence within teams operating in dangerous situations. Though our results show promising discoveries in team, shared leadership, and dangerous contextual research, further investigation within this line of inquiry may yield additional results enabling organizations to more effectively maximize team performance in life or death situations.

REFERENCES

- Carson, J., Tesluk, P., & Marrone, J. (2007). Shared leadership in teams: An investigation of antecedent conditions and performance. *Academy of Management Journal*, 50(5), 1217-1234.
- Creswell, J., & Plano Clark, V. (2007). *Designing and conducting mixed methods research* (1st ed.). Thousand Oaks, CA: Sage.
- Creswell, J., & Plano Clark, V. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Currie, G., Lockett, A., & Suhomlinova, O. (2009). Leadership and institutional change in the public sector: The case of secondary schools in England. *The Leadership Quarterly*, 20(5), 664-679.
- Gardner, W., Lowe, K., Moss, T., Mahoney, K., & Cogliser, C. (2010). Scholarly leadership of the study of leadership: A review of the leadership quarterly's second decade, 2000-2009. *The Leadership Quarterly*, 21(6), 922-958.
- Lindsay, D., Day, D., & Halpin, S. (2011). Shared leadership in the military: Reality, possibility, or pipedream? *Military Psychology*, 23(5), 528-549.
- Merriam, S. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Pearce, C., & Conger, J. (Eds.). (2003). *Shared leadership: Reframing the hows and whys of leadership*. Thousand Oaks, CA: Sage.
- Ramthun, A. (2012, March). *Shared leadership in dangerous environments*. Paper presented at Western Academy of Management Annual Meeting, La Jolla, CA.
- Ramthun, A., & Matkin, G. (2012). Multicultural shared leadership: A conceptual model of shared leadership in culturally diverse teams. *Journal of Leadership & Organizational Studies*, 19(3), 303-314.
- Ramthun, A., & McElravy, L. (2012, October). *Boundary conditions and measurements for shared leadership in teams: Investigating dangerous environments, social power distribution, and social network analysis*. Paper presented at Midwest Academy of Management Annual Meeting, Chicago, IL.
- Small, E., & Rentsch, J. (2010). Shared leadership in teams: A matter of distribution. *Journal of Personnel Psychology*, 9(4), 203-211.

- Stentz, J., Plano Clark, V., & Matkin, G. (2012). Applying mixed methods to leadership research: A review of current practices. *The Leadership Quarterly*, 23(6), 1173-1183.
- Taylor, A., Cocklin, C., Brown, R., & Wilson-Evered, E. (2011). An investigation of champion-driven leadership processes. *The Leadership Quarterly*, 22(2), 412-433.
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks, CA: Sage.

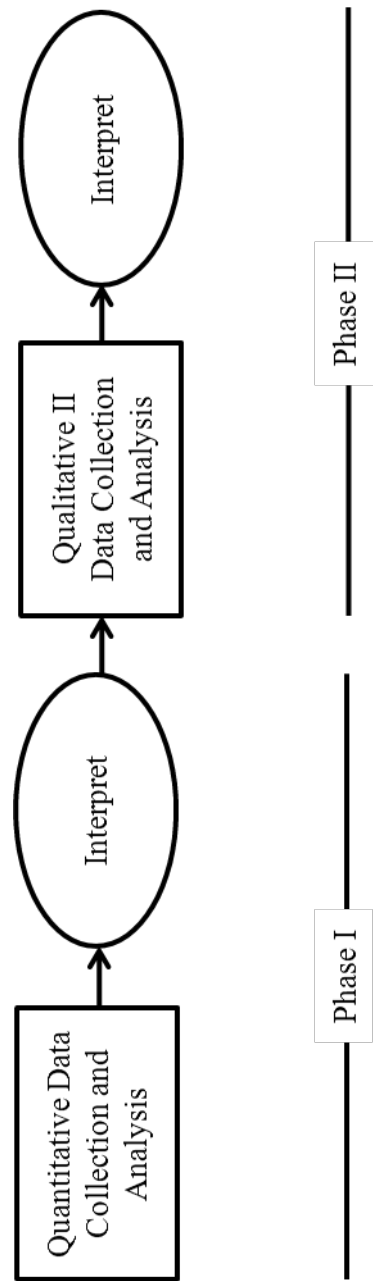


Figure 1. Study’s mixed methods design.

APPENDIX

Appendix A

Phase I Approved IRB Informed Consent Form / Letter



INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
DEPARTMENT OF AGRICULTURAL LEADERSHIP,
EDUCATION AND COMMUNICATION

IRB#13000

Shared Leadership in Dangerous Environments Research Informed Consent Form

The purpose of this study is to test a theoretical model of shared leadership in dangerous environments predicting military team performance. We respectfully request your participation in this study in order to provide empirical data relating your leadership and military team performance. The results from your participation shall provide further understanding of shared leadership in dangerous environments and team performance and benefit your organization by providing them with an actionable model of shared leadership for integration into officer leadership programs.

Participation in this study shall require only a small amount of your time through the completion of a 5-20 minute team combat scenario using paintball guns at a military urban combat training site near Camp Ashland, NE and 20 total minutes of pre and post scenario paper surveys. The study may require you to employ paintball guns and shall require you to wear personal protective equipment (PPE) to prevent injuries related to paintball strikes. You shall be required to maintain your PPE on your body at all times during the paintball scenario. If you voluntarily remove your PPE during the scenario, there is a risk of injury to your body from a paint ball strike. Being struck with a paintball may cause some minor discomfort. Additionally, the research site may have minor tripping hazards on the ground where participants enter/exit doorways. There is also gravel on deck that may cause minor abrasions if a participant falls to the ground. Outside of this, there are no known risks or discomforts associated with this research. Medical personnel are on site to provide you with first aid support at no cost. However, individual participants shall be responsible for other expenses incurred if a participant would be injured as a result of participation in this study.

All the data gathered during this study shall be kept strictly confidential. Basic demographic data (i.e. name, gender, military experience, etc.) and questions regarding your team orientation, personality, positive psychology, and leadership shall be collected; a third party objective rater shall fill out a survey on your team's performance. The paper surveys shall be destroyed once the data has been transferred to a secure, password protected network. Your personal privacy and identity shall be protected at all times. The results of this study may be published in scientific journals, at scientific conferences, and to scholastically focused groups. The researchers shall ensure individuals are not identifiable through data reporting.

Your participation in this study is completely voluntary. You shall be provided with a paintball gun, paintballs, PPE, and other logistical support at no cost of your own; however, there is no direct compensation for your participation. All participants must be 18 years of age or older and must be members of an ROTC unit or current active duty, national guard, or reservist military personnel.

You are free to decide not to participate in or withdraw from this study at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled. Also, non-participation or withdrawal from the research shall not affect your relationship with the military, ROTC, National Guard, or the Reserves.

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may contact the investigator(s) at the phone numbers below. Please contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965 to voice concerns about the research or if you have any questions about your rights as a research participant.

You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep for your records. Thank you very much for your consideration of this matter.

Signature of Participant _____ Date _____

Sincerely,

Major Alex J. Ramthun (UNL Office Phone: 402-472-4441 & Email: aramthun2@unl.edu)
Mr. L.J. McElravy (UNL Office Phone: 402-472-2807 & Email: lj.mcelravy@gmail.com)

Appendix B:

Phase II Approved IRB Informed Consent Form / Letter



INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
DEPARTMENT OF AGRICULTURAL LEADERSHIP,
EDUCATION AND COMMUNICATION

IRB#13262

A Phenomenological Description of Shared Leadership in Teams Operating within Dangerous Contexts

The purpose of this study is to richly describe the results from the quantitative research project entitled, "Boundary Conditions and Measurements for Shared Leadership in Teams: Investigating Dangerous Environments, Social Power Distribution, and Social Network Analysis." We respectfully request your participation in this study in order to provide qualitative interview data relating your scholarship and/or experience with shared leadership and/or military teams. The results from your participation shall provide an improved understanding of shared leadership in dangerous environments, advancing the field of leadership and educating practitioners.

Participation in this study shall require only a small amount of your time through the completion of an 18-question, semi structured, 60-minute phone interview with a researcher. There are no known risks or discomforts associated with this research. Your participation in this study is completely voluntary; there is no compensation for your participation. All participants must be 19 years of age or older.

All the data gathered during this study shall be kept strictly confidential. Basic demographic data (i.e. name, gender, professional experience level, etc.) and questions regarding leadership shall be collected via phone interview notes and a digital voice recorder. All phone interviews are recorded and transcribed for post-coding analysis. Audio files and hand notes from the interviews are destroyed after transcription. The transcriptions shall be in the form of password protected word documents, stored password protected network. Transcripts are destroyed following the analysis of the data. Your personal privacy and identity shall be protected at all times. The results of this study may be published in scientific journals, at scientific conferences, and to scholastically focused groups. The researchers shall ensure individuals are not identifiable through data reporting.

You are free to decide not to participate in or withdraw from this study at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may contact the investigator(s) at the phone numbers below. Please contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965 to voice concerns about the research or if you have any questions about your rights as a research participant.

You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep for your records. Thank you very much for your consideration of this matter.



Please check this box to confirm your agreement to be digitally recorded during the interview.

Signature of Participant

Date

Sincerely,

Major Alex J. Ramthun (UNL Office Phone: 402-472-4441 & Email: aramthun2@unl.edu)
Mr. L.J. McElravy (UNL Office Phone: 402-472-2807 & Email: lj.mcelravy@gmail.com)
Dr. Gina S. Matkin (UNL Office Phone: 402-472-4554 & Email: gmatkin1@unl.edu)