TRANSFORMATIONAL LEADERSHIP AND ORGANIZATIONAL CHANGE DURING

AGILE AND DEVOPS INITIATIVES

by

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Abstract

Organizational change initiatives are more likely to fail than to succeed, especially when the change challenges corporate culture and norms. Researchers have explored factors that contribute to change failure, to include the relationship between leadership behaviors and change success. Peer reviewed studies have yet to examine these variables in the context of Agile and DevOps implementations as the catalyst for change. The purpose of this quantitative, correlational study was to determine the extent to which a relationship exists between transformational leadership behaviors of front-line managers, employee readiness for change, and employee organizational citizenship behavior during Agile and DevOps initiatives. The population included all IT professionals in the U.S. working full-time at companies with more than 500 employees whose work processes had been altered by Agile or DevOps implementations. A sample of 400 qualified panel participants provided data through an online SurveyGizmo survey. Quotas ensured that the survey sample represented the gender and ethnicity distribution among U.S. IT professionals according to the U.S. Bureau of Labor Statistics. Data collected were analyzed for missing data, reliability, and normality. Pearson's r calculations and linear regression analysis revealed that a moderate yet statistically significant correlation exists between the transformational leadership behaviors of respondents' front-line managers and their own readiness for change and organizational citizenship behavior. The results could have been skewed by the higher than expected proportion of managers and executives who responded to the survey. Future researchers could extend the work started in this present study by adding quotas to ensure the survey responses align to average employee-manager ratios. This study could also be replicated with participants in a single company so that findings could be supported through qualitative methods such as interviews and panel discussions.

Dedication

This dissertation is dedicated to my father and mother who adopted me and made me everything I am today. They modeled love for God, love for each other, love for their family, and love for their neighbor in ways that still amaze me. They gave me a thirst for knowledge, the discipline to do everything with excellence, and a heart of gratitude for the blessings we enjoy that so many others do not. Although my father is no longer with us, I believe with all that I am that he is looking upon this milestone in my life with great pride. Dad, this one is for you. I also dedicate this dissertation to my loving wife Alicia for her unwavering support and understanding through this process. This milestone would not have been possible without her encouragement, patience, and sacrifice. I likewise acknowledge the support of our five children Kaitlyn, Sarah, Brittany, Lane, and Rebekah who demonstrated gracious indulgence during all those times my studies took me away from family events. Most importantly, I dedicate this effort to my Creator and Savior for giving me the abilities and the drive to grow so that I could help others. May I use His grace wisely. Thanks Papa…

Acknowledgments

One of the most unquestionable lessons learned through this journey is that behind every person who carries the title of "Doctor" is a team of dedicated scholars and professionals without whom such an accomplishment would not have been possible. I am no exception. I would like to acknowledge my mentor Dr. Rick Daniels for his wisdom, his encouragement, his correction, and his unwavering belief in me through every step of this process. I would also like to thank my committee members Dr. Michael Marticek and Dr. Gayle Grant. Their critiques along the way significantly improved the contribution of this dissertation to the body of knowledge. Thanks to Dr. William McKibbin and his practical approach to statistical analysis that gave me the confidence to select a quantitative methodology for my study. I also want to thank my peer Dr. Mike Mella who graciously shared his insights from being a few steps ahead of me following our last residency. All of these individuals contributed of their time and knowledge unselfishly, demonstrating the highest ideals of scholarly leadership.

Table of Contents

List of Tables

List of Figures

CHAPTER 1. INTRODUCTION

Introduction

Organizational change (OC) can be challenging, but it is an essential capability for companies that desire to thrive in today's global economy (McKnight, 2013). Research shows that companies engaging in strategic OC initiatives are more likely to fail than to succeed (Decker, Durand, Mayfield, McCormack, Skinner, & Perdue, 2012). This phenomenon of difficulties with OC is a common occurrence in virtually every industry, and the costs of failed attempts at change can be crippling (Amburgey, Kelly, & Barnett, 1993; Burke, 2011; Higgs & Rowland, 2011; Wolf, 2006). The frequency of failure by organizations to achieve the intended goals of change initiatives varies according to the literature. Shin, Taylor, & Seo (2012) cited data collected in multiple studies over the previous decade that indicated a 50% failure rate across all types of change initiatives. The results of Burke's (2011) research focused on the same period estimated 70% of all change efforts were unsuccessful. Cândido and Santos (2015) observed a 41% to 93% failure rate among quality improvement initiatives that occurred from 1979 to 2014 (documented in 35 separate studies). Many of these studies were inspired by seminal works such as Kotter (1996) and The Standish Group (2001) that asserted 70% of change efforts failed to meet time, cost, and scope parameters. The significance of this comparison is that after more than a decade of research following Kotter's claim of 70% failure rates, researchers continued to see similar results in their studies. Business leaders need a greater understanding of the factors that impede significant OC efforts to develop approaches to

1

overcoming these barriers to innovation, and to successfully achieve the strategic objectives of change.

At the center of many discussions related to OC is the role of the leader in preparing employees for and leading them through change. Research shows that leaders at all levels of an organization play a vital role in the successful adoption of change (Vakola, 2013). In fact, the more innovative, disruptive, and transformational the change, the greater the need for sophisticated leadership that can inspire employees to embrace new business models (Denning, 2005; Feng, Huang, & Zhang, 2016). However, additional research is needed to more thoroughly understand the relationships between the causal factors for failure in change initiatives (Burnes, 2011; Cândido & Santos, 2015), how organizations prepare for change (Armenakis, Brown, & Mehta, 2011; Vakola, 2013), and how managers lead through change (Carter et al., 2014; Morrissey, 2014).

In the years since Smith (2002) cataloged the different types of organizational change initiatives and their rates of success according to a survey of the literature, businesses have engaged in two new kinds of transformational change that Smith (2002) did not consider. Agile software development (Koch, 2005, p. 225) and DevOps (Roche, 2013) have been gaining wide-spread adoption in companies large and small. The term Agile refers to creating software using the iterative and incremental practices enabling companies to respond to rapidly changing requirements (Anderson, 2004, p.xxviii). DevOps extends Agile concepts to other IT departments such as infrastructure, networking, data center operations, and support (Roche, 2013). Each concept requires a shift away from traditional project management practices that are often deeply entrenched in the way organizations build technology-based capabilities. Agile and

DevOps adoption leads to significant organizational change, and both are subject to the same failure rates as other transformational initiatives.

Research published over the last decade has given much attention to the positive effects of transformational leadership (TL). More recently, researchers have reaffirmed the findings of Bass and Riggio (2006) as well as Pawar and Eastman (1997) that TL may hold the key to improving the success of OC by lowering employee resistance to change (Teoh Kae & Rashad, 2015). Scholarly research that validates this connection and identifies recommendations for practical applications can provide significant contributions to developing a framework that will increase organizations' probability for successful change initiatives.

Background

This study examined the potential for leaders to enhance the likelihood of success in a strategic OC effort by exhibiting leadership attributes that can help overcome the underlying reasons for employee's resistance to transformational change. Specifically, the focus of this present study was to extend the existing body of research through a quantitative study that sought to determine if a TL style by front-line managers relates to increased employee buy-in and readiness for OC. Carter, Armenakis, Feild, and Mossholder (2013) conducted a quantitative study that found similar correlations between TL and employee performance during continuous incremental change. The goal of this present research was to test related variables among Information Technology (IT) professionals working at large U.S. based companies engaging in transformational change. Specifically, this study examined the relationship between TL, success factors critical to organizational change, and employee engagement in the context of Agile and DevOps initiatives.

In addition to the research by Carter et al. (2013), there are a number of core articles that contributed to the formulation of this study. Decker et al. (2012) constructed a framework of critical failure factors from the body of literature that aids in understanding the reasons why transformational efforts are challenged. In a contemporary survey of over 3,000 corporate executives, two-thirds reported that their companies failed to achieve intended performance improvements following OC initiatives (Meany & Pung, 2008). Grady and Grady (2013) concluded from a survey of the literature that 68% of OC efforts fail or experience serious challenges. This pattern of failure in OC efforts has received intense focus from scholars in recent years (Burnes, 2011).

Studies conducted by Andersson (2015), Rafferty, Jimmieson, and Armenakis (2013), and Teoh Kae and Rashad (2015) affirmed previous research identifying employee resistance to change as the leading cause of failure in OC initiatives. Avey, Wernsing, and Luthans (2008) found that positive employee attitudes and employee engagement described as Organizational Citizenship Behavior (OCB) improved the success rate of organizational change by lowering employee resistance. Studies by Rafferty, Jimmieson, and Armenakis (2013), as well as Holt and Vardaman (2013), outlined additional actions that individuals and organizations can take to increase employee readiness for change. The conclusion of these studies is that high employee OCB and high readiness for change correlates to greater success rates of OC initiatives.

Carter et al. (2014) examined the role of middle managers in leading change by improving employee OCB and readiness for change. Irshad & Hashmi (2014) in their research strengthened the argument for a correlation between TL and OCB. The effectiveness of training leaders in TL behaviors has also received the attention of researchers (Weber & Kelloway, 1996; Brown & May 2012; Parry & Sinha, 2005). The examination of these studies, as well as other

4

related literature on OC, TL, and employee behaviors, may provide relevant insights for organizations and change leaders as they seek ways to increase the chances that transformational change initiatives will achieve their intended outcomes.

Business Problem

Organizations engaging in transformational change initiatives such as Agile and DevOps adoption face a high probability that their efforts will fail (Decker et al., 2012). Research shows that resistance to change in the organizational culture represents the most frequent barrier to Agile and DevOps implementations (Ghani, Bello, & Bagiwa, 2015; Fiampolis & Groll, 2016). This finding aligns with studies showing that employee attitudes resulting in resistance to change are the most often cited impediment to the success of OC (Rafferty, Jimmieson, & Armenakis, 2013; Andersson, 2015). Successful OC and organizational agility are essential to competitive factors such as time-to-market, quality, and customer satisfaction (McKnight, 2015; Morris, Ma, & Wu, 2015). Although Carter et al. (2013) demonstrated that TL could improve employees' attitudes toward change, there is a gap in research exploring the relationship between TL, readiness for change, and OCB specifically in the context of Agile and DevOps implementations. A search through the EBSCO and ProQuest databases for scholarly literature found no articles or dissertations focused on OC, TL, OCB, or readiness for change as part of Agile and DevOps adoption. This gap represents a significant opportunity to expand the body of knowledge with groundbreaking work that can help leaders understand the factors that can influence the success or failure of Agile and DevOps initiatives.

Research Purpose

The purpose of this quantitative, correlational study was to investigate the relationship between TL behaviors exhibited by front-line managers, and IT employees' readiness for change

and OCB during Agile and DevOps initiatives in U.S. based companies with 500 or more employees. This research filled a gap in the literature by being the first scholarly effort to quantitatively examine these variables among employees engaged in Agile and DevOps transformations. Given the widespread growth of these systems development models, the addition of the insights derived from this present study provided a significant and unique contribution to the body of knowledge as well as tangible insights for practitioners seeking ways to improve the success rate of their Agile and DevOps initiatives.

The data collected in this current study was used to conduct an analysis of the correlation between TL and employee OCB and readiness for change (which incorporates climate of change, process factors of change, and readiness for change, as outlined by Bouckenooghe, Devos, & Van, 2009). The study used a random sample of Information Technology (IT) professionals employed full-time at U.S. based companies with 500 or more employees that had implemented Agile Development or DevOps. Companies of this size meet the definition of "large companies" according to the criteria published by the U.S. Small Business Administration (SBA) and the U.S. Census Bureau (Thomas, 2012). The selection of employees from large companies reflected the exponential complexity of Agile and DevOps at enterprise scale (Leffingwell, 2011).

Research Questions

Given the observation by Rafferty, Jimmieson, and Armenakis (2013) that described resistance to change as the most common barrier to change success, one question that arises for further research relates to the reasons why employees are resistant to change. Peer-reviewed research has explored possible explanations to include human nature (Armenakis, Brown, & Mehta, 2011), managerial styles and practices (Bridwell-Mitchell & Mezias, 2012), and top-down management of change (Raelin & Cataldo, 2011). Other studies examined the relationship

6

between OCB, leadership approaches, and the acceptance of employees to change (Irshad & Hashmi, 2014). Rafferty, Jimmieson, and Armenakis (2013) also posited that readiness for change contributes significantly to the probability of success in a change initiative. From among the areas of exploration that arise from the business problem described above, this dissertation focused on two questions; both within the context of large U.S. companies adopting Agile and DevOps:

- RQ1: To what extent does a relationship exist between TL behaviors of front-line managers and employee readiness for change during Agile and DevOps initiatives?
- RQ2: To what extent does a relationship exist between TL behaviors of front-line managers and employee OCB during Agile and DevOps initiatives?

Rationale

With the dynamics of volatile markets, globalization, shifting demographics, and a rapidly evolving technological landscape driving the need for organizations to engage in transformative efforts in order to innovate for competitive advantage, and with the historical track record of such initiatives indicating that failures are common, the need for a more practical approach to leading change is greater than ever. Successful change is essential for companies to survive and prosper (Brown & Eisenhardt, 1997). Researchers frequently cite TL as a critical success factor for effective management of OC (Teoh Kae & Rashad, 2015). Recent studies such as the research by Carter et al. (2013) have laid the foundation for empirical contributions that connect TL to reducing employee resistance to OC. Similarly, there is a need to explore the relationship between TL and readiness for change, but few studies have been performed to test this connection empirically (Rafferty, Jimmieson, & Armenakis, 2013). The research conducted as part of this study was built on the on the contributions of these authors.

7

Theoretical Framework

This was a quantitative study designed to examine the interrelation between TL theory as described by Burns (1978) and two factors shown in the literature to contribute to successful change: OCB (Organ, 1988; Podsakoff, MacKenzie, Paine, & Bachrach (2000), and readiness for change (Bouckenooghe, Devos, & Van, 2009). OCB draws from elements of social-exchange theory (Homans, 1958). Readiness for change incorporates Lewin's (1951) change theory, as well as individual differences theory, social differentiation theory, and social relationship theory as described by DeFluer and Ball-Rokeach (1989). The study viewed OCB and readiness for change from the perspective of change antecedents. The research focused on the influence of the front-line manager's TL behaviors and the two dependent variables that mitigate key barriers to successful OC according to the literature (Rafferty, Jimmieson, & Armenakis, 2013). The survey also included several categorical questions as control variables for additional data analysis. Figure 1 provides a graphical depiction of the theoretical framework of the study.


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┌─────────────────────────┐                    ┌─────────────────────────┐
│   Transformational      │                    │   Readiness for Change  │
│     Leadership          │──────────────┐  ──▶│                         │
│     Behaviors           │              │     │   Change theory         │
│                         │              │     │   Lewin (1947)          │
│ Transformational        │              │     └─────────────────────────┘
│ leadership theory       │              │
│ Burns (1978)            │              │     ┌─────────────────────────┐
└─────────────────────────┘              └──  ▶│   Organizational        │
                                               │   Citizenship Behaviors │
                                               │                         │
                                               │   Social-exchange theory│
                                               │   Homans (1958)         │
                                               └─────────────────────────┘
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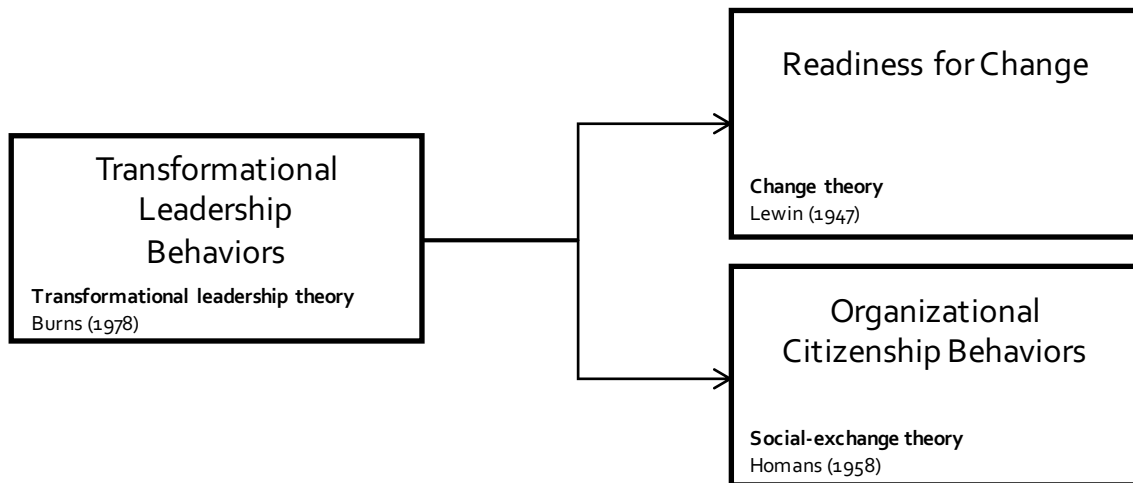
Figure 1. A conceptual model portraying the relationships between TL and factors related to change barriers this study explored. The footnotes cite base theories and core literature.

8

The survey was constructed using two pre-existing instruments. TL and OCB were examined using questions from a survey developed by Podsakoff, MacKenzie, Moorman, and Fetter (1990). Respondents were asked to focus their TL answers considering the leadership behaviors of their front-line manager, and the OCB questions considering their own behaviors as a self-assessment. This use of the OCB questions in the survey by Podsakoff, et al. (1990) is consistent with previous scholarly peer-reviewed research (Al-shrafi & Rajiani, 2013). Readiness for change was evaluated using OCQ-C, P, R, a battery developed by Bouckenooghe, Devos, and Van (2009). Categorical data such as IT specialty, size of the organization, level in the organization, and demographics were also collected to enable greater depth in the analysis process. The results of the surveys were examined using quantitative analytics, findings documented, and conclusions drawn regarding the relationship between TL behaviors and these two antecedent success factors for successful OC. These findings provided the basis for insights large U.S. based companies should consider when planning transformational changes to the organization, specifically Agile and DevOps initiatives.

Significance

Organizational success (and possibly survival) is dependent upon companies' ability to adapt and transform to meet the challenges of a dynamic competitive landscape. As a result, finding ways to improve the rate of success in change initiatives is a critical, contemporary, and relevant topic for further research (Ashurst & Hodges, 2010). The significance of this study is in its examination of TL and its ability to directly influence the primary factors cited in the literature that have been shown to contribute to the success of change efforts. While substantial research has been conducted examining various aspects of the relationship between TL and OCB, a gap in the research existed that would provide quantitative evidence evaluating this relationship as well

9

as the relationship with readiness for change, in the context of Agile and DevOps adoption. With existing survey instruments related to the variables represented in the research questions above, this study sought to collect data from IT practitioners working at large U.S. based companies implementing Agile and DevOps with the intent to address this gap in the literature. The results of this research produced findings that suggested specific measures large organizations could take as a means to increase the probability that strategic changes such as Agile and DevOps initiatives would achieve their intended objectives.

Definition of Terms

Agile Development: An approach to developing software grounded in the concepts of Lean manufacturing that promotes the rapid creation of software in an iterative and incremental fashion. Agile enables response to changing requirements through frequent communication between the technical team and business proponents (Anderson, 2004, p.xxviii).

Change readiness: "An individual's beliefs, attitudes, and intentions regarding the extent to which changes are needed and the organization's capacity to successfully undertake those changes" (Armenakis, Harris, & Mossholder, 1993, p. 681).

DevOps: The implementation of Agile concepts in elements of the IT organization beyond the software development team (infrastructure, networking, data center operations, support). It also implies breaking down silos between development and operations to focus on the end-to-end delivery of value through software based capabilities (Roche, 2013).

Organizational citizenship behavior: "Individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system and that in the aggregate promotes the effective functioning of the organization" (Organ, 1988, p. 4).

Transformational change: "Transformational change calls for a paradigm shift in thinking about products or services and requires double-loop learning and deuteron-learning" (Alas & Vadi, 2003, p.85).

Transformational leadership: "Raising followers' level of consciousness about the importance and value of desired outcomes and the methods of reaching those outcomes, transcending their own self-interest for the sake of the organization" (Burns, 1978, pp. 141, 619).

Assumptions and Limitations

A significant assumption in this study was that the panel aggregator would be able to identify a sufficient number of panelists from among their database who meet the sample frame definition to achieve the required sample size of 384 for statistical significance of an unknown population. A related assumption was that the panel aggregator would be able to provide 384 complete, clean surveys. Complete surveys are those where all questions have been answered by the respondent. Clean surveys are also those that have passed through data cleansing features of the survey tool designed to detect common signs that the responses are valid. Examples of these signs include straightlining (for example answering "1" to every question), answer patterns, speeding through surveys, and incorrect answers on trap questions. Finally, this study assumed that respondents would understand each question, and would be as truthful and objective as possible in their responses.

One of the key limitations of the study was the limited ability to control or even identify all of the variables that could contribute to the success or failure of a strategic change initiative. This study only focused on three factors that can contribute to a major change effort achieving its intended goals. Other variables such as education, tenure, geographical dispersion, and more could also play a role in an employee's response to change.

Another limitation was that while the OCB instrument is a comprehensive measure of employee engagement behaviors, the questions were worded from the perspective a peer or manager evaluating the employee. This design used the same questions but asked respondents to consider their own attitudes and behaviors as a self-evaluation. People find it challenging to be objective when evaluating their own behaviors, leading to skewed self-evaluations.

An additional limitation of this study was my inherent biases both in formulating the research parameters as well as in the interpretation of the results. There are several common patterns of researcher bias, including confirmation bias, culture bias, question order bias, and halo effect (Sarniak, 2015). Some forms of bias were mitigated in this study by the selection of a quantitative method using existing published scales. As an example, this research eliminated question order bias since the order of the questions were determined by the authors of the scale instead of by me. The use of anonymous surveys eliminated the possibility of leading questions, wording bias, and the halo effect. The most significant risk for bias in this study was confirmation bias, specifically in the analysis of the data and the formulation of observations. I implemented techniques recommended by Luippold, Perreault, and Wainberg (2015) to counteract this bias, to include avoiding premature conclusions, identifying at least three potential causes for data patterns, attempting to prove conclusions wrong, and circling back to consider new hypothesis based on the data.

Lastly, this study was based on a random sample of IT professionals in the U.S. working for large companies implementing Agile and DevOps. Many of the studies on organizational change include research conducted within individual companies. While sampling a much larger population had its own advantages, it did deviate from the core literature that inspired this effort.

Organization for Remainder of Study

This opening chapter conveyed an introduction to the areas of focus for this dissertation topic, reviewed a summary of the related literature, established the relevant business problem, identified where gaps in the literature provided opportunities for further research and argued for this study's relevance. Further, this chapter articulated the justification for the research that follows, communicated the questions this research attempts to answer and promoted the contribution this study makes to the body of knowledge organizations and leaders can use to plan better and execute change initiatives. Finally, this chapter provided definitions to key terms found throughout this dissertation and summarized the central literature used as the basis for building this study.

The pages that follow include four additional chapters. Chapter 2 contains an extensive review of the literature used in the formation of this study. Scholarly works align to fundamental themes such as OC, leadership, culture, leadership training, and employee behaviors. The reviews include descriptions that establish the relationships between the conclusions of each referenced work and the central research questions formulated for this study. In Chapter 3, Methodology, the research design is outlined to include the procedures and methods used to collect and analyze the targeted data. It also provides readers with an explanation as to reasons behind the choice of research design. Chapter 4 is titled Results, and it presents a detailed and thorough explication of the results of the research findings along with an analysis using applied statistical methods. Lastly, Chapter 5 (Conclusions) provides a final summary of the research, the conclusions, the implications, along with recommendations for further research.

CHAPTER 2. LITERATURE REVIEW

Introduction

Advancing understanding of the nature of change within organizations is vital given the tensions between the necessity for change and the rate of failure in change initiatives. This literature review opens with a survey of studies substantiating concerns that corporate change initiatives are more likely to fail than to succeed. The balance of the literature review focuses on change from three distinct lenses: the organization, the employee, and leaders. The review of literature dedicated to the first lens begins with a consideration of the seminal works that created the basis for the contemporary understanding of change from the organizational perspective. Starting with the works of Max Weber and Kurt Lewin, the review surveys the contributions of leading authors who have advanced various theories and models of OC. These models provide practical disciplines designed to assist corporate leaders in the task of guiding their companies through periods of significant change. The opening section continues with an examination of the literature surrounding transformational change and how it differs from other forms of OC. The first perspective concludes with research focused on managing change, including viewpoints that challenge traditional thinking that leaders can control change. Researchers have given much attention to conventional OC management (OCM), with consideration for alternative views such as organic change and the influence of chaos theory. This section also provides a focused discussion on the organizational change implications of Agile and DevOps initiatives.

The second part of the literature review considers change through the lens of the employee. Although some individuals positively respond to change, the preponderance of literature cites employee resistance to change as the most common impediment to OC initiatives achieving their intended results (Van Dijk & Van Dick, 2009). Understanding the factors that

contribute to the reaction of resistance to change by employees provides leaders with the tools needed to navigate this response to change. As promoted by Dr. Steven Covey's fifth habit "seek first to understand, then be understood," (Epler, 2014, p. 15), learning and empathizing with the concerns that are prompting employees to resist a particular change initiative can lead to critical two-way communications that can positively influence the resistance response. A related concept explored in this section of the literature review focuses on discretional employee behavior beyond the boundaries of the company's formal reward system that they perform for the greater good of the organization (Irshad & Hashmi, 2014). Scholars refer to these traits as organizational citizenship behaviors, or OCB. This section explores the research contributing to the greater understanding of OCB, and how researchers have connected OCB to decreased resistance to change.

The last lens for viewing change examines the role of formal and informal leadership at all levels of the organization in effecting change. Companies often initiate OC as the result of decisions senior leaders make to meet the challenges of a dynamic and competitive market (Ashurst & Hodges, 2010). Leaders initiate change. Leaders also have the institutional authority to influence positively factors that can lower employee resistance to change. Another dimension that gets less attention in the literature is the fact that even though leaders initiate change, they are also influenced by the change and can experience the same feelings of angst and resistance as their employees. This portion of the literature review examines the roles and behaviors of leaders as they guide their organizations through periods of change. An additional consideration is given to the roles that middle and front line managers play in influencing employee response to change, as well as the role of informal and situational leadership. The review also provides a foundation from the literature for a greater understanding of TL, given that a body of scholarly articles has

been published that establishes a positive relationship between this leadership approach and improved success in change initiatives (Carter et al., 2012). The final element to this perspective examines the role of leadership training, and whether or not TL behaviors can be effectively taught, especially to individuals who have adopted competing leadership perspectives. The review culminates in a final summary and synthesis of the literature that informed the research boundaries and underpinnings of the study.

Change from the Organizational Perspective

Organizational Change History and Theory

The phenomenon of organizations undergoing change dates as far back in recorded history as the biblical account of Moses instituting a hierarchical structure of leadership to govern the newly formed nation of refugees from Egypt. The *study* of OC is a relatively new discipline. Burke (2014) traced the lineage OC back to its precursors, beginning with Max Weber theory of bureaucracy (Hatch, 2006) in the late 1800's and Fredrick Taylor's concepts of scientific management (c.1911). Each offered solutions for navigating change as part of their respective theories. Weber's theory focused on improving organizational performance through the formulation of rules and procedures to enforce consistency, along with a formal structure for the division of labor. By comparison, Taylor focused on the optimization of human action through the elements of control, efficiency, predictability, and quantification (Hutchinson, 1999). His goal was to identify the single best way to perform any given task in an overall process. By the early 1900's, Fayol added the theory of management, which added the ideas of organizing similar activities into departments (Hatch, 2006). He also introduced the concept of the unity of command, whereby each person in the company reports to a single supervisor. In the 1920's and

16

1920's, human relations theory was added to the discussion by Elton Mayo. Mayo's famous Hawthorne experiment added the social dimension to organizational theory.

Scholars frequently credit the focused study of OC as emerging from the writings of Kurt Lewin c. 1947 (Elrod & Tippett, 2002), and progressing to more contemporary scholars such as Kotter (1996). Van de Ven and Poole (1995, p. 512) defined OC as "a difference in form, quality, or state over time in an organizational entity." Lewin's (1947) change theory suggested that for change to occur, longstanding processes had to be broken. In his three step process for OC, he referred to this process as the *unfreezing* stage where companies must be willing to set aside the "we've always done it this way" mentality. In the *moving stage*, organizations implement the needed change, followed by a *refreezing* process where the new way of doing things is institutionalized. Extending Lewin's model and the theory of change he developed, Barczak, Smith, and Wilemon (1987) promoted four steps for change that included: *pattern breaking* (similar to unfreezing), *experimenting* to examine alternatives to the current process, *visioning* to align systems to the new process, and *bonding and attunement* where leaders help organization members adjust to doing things differently. Clarke and Garside (1997) took the approach of simplifying the process into three core steps that encompassed: mapping the current process, identifying tools and methods other organizations used to execute similar processes, and merging the best theoretical and practical alternatives used by companies to implement their change to form a model unique to organizational context.

The most frequently referenced resource for planning and leading OC may be Kotter's (1996) eight step model (Applebaum, Habashy, Malo, & Shafiq, 2012), which he built as an extension of Lewin's (1951) work. Kotter's steps incorporated: creating a sense of urgency, building a change coalition, defining the vision and strategy behind the change, communicating

that vision to the organization, empowering members of the organization at all levels to act to implement the change, focusing on immediate wins to provide confidence in the change, building on those successes to expand the scope of the change, and institutionalizing the new processes into the company culture.

Although both Lewin's (1951) and Kotter's (1996) linear step-wise processes for guiding OC appear simple to follow, critics argue that large-scale change is difficult and can be chaotic. Change is complex and emotional, often defying a linear, orderly march forward (Carr, 2000). The reality of actual experiences of organizations undergoing change demonstrates that rational checklist approaches rarely survive as designed. Steps overlap, are re-sequenced and implemented more than once as companies iterate through change (Boyatzis, 2006). Marshak (2006) agreed with Boyatzis (2006) and further asserted that failing to consider non-rational perspectives on OC can result in missing opportunities to mitigate adverse effects of change. Consensus exists among scholars that Kotter's (1996) model is a sound starting framework, but organizations must balance it with additional non-linear approaches and information that exposes gaps between planned and actual results from the implementation of OC initiatives (Schwering, 2003). Elrod and Tippett (2002) provided a survey of 15 distinct models developed since Lewin's (1951) original work, illustrating the ongoing efforts by scholars and practitioners to understand the nature of OC and the need to provide leaders with researched alternatives to successfully guide change.

The Need for Organizational Change

Organizations face an ever-evolving business landscape that must be expertly navigated to remain competitive and profitable. Virtually every company operating in 2015 has already experienced significant change, and will continue to experience a need to implement change

effectively on an ongoing basis (Chung & Hsu, 2010). Thompson, Peteraf, Gamble, and Strickland (2013) provided a model illustrating factors in the immediate market environment (new entrants, customers, suppliers, alternative products) and the macro-environment (economy, politics, environment, regulations, technology, socio-cultural influences) that are always creating pressure on companies to change in order to stay competitive. Shifts are constant on all of these fronts, creating the need for organizations to understand the change process to adapt successfully and innovate (McKnight, 2013). De Smet, Lavoie, and Hioe (2012) made the case that significant periodic changes to the heart of a business are difficult to avoid. The Boston Consulting group conducted a study in which 72% of the senior executives who responded listed adaptability to change among their top three priorities as corporate leaders (McGregor, 2006). The consensus from the literature is that organizations cannot remain static and survive in most industries. Instead, thriving companies that manage to grow in the face of constantly evolving market dynamics are those that have developed a capability to implement change successfully.

Failure of Organizational Change Initiatives

The intensity of interest in the topic of OC continues to grow in light of exponential shifts in global market dynamics. Burnes' (2009) survey of the literature concluded that it is increasingly important for organizations to cultivate a core competency for implementing change. Researchers have sought to understand through scholarly studies the phenomenon observed by practitioners that OC initiatives are more likely to fail than to succeed (Burnes, 2011). In the 1970's, an early study by Crosby (1979) asserted that 90% of corporate quality improvement initiatives failed. The first emergence of the oft-cited "70% failure rate" in OC efforts came from Hammer and Champy (1993). Senturia, Flees, and Maceda (2008), Kotter (1996), and Beer and Nohria (2000) cited that same figure. The research of The Standish Group

19

(2001) implied a similar failure rate. The authors asserted that only 28% of software development projects met their intended time, cost, and scope targets.

Several theories persist regarding the causal factors behind the high failure rates of change initiatives, although researchers have not yet coalesced around a shared list. In fact, Decker et al., (2012) posit that the continued frequency of failed OC initiatives is due in part to the lack of a standard definition, systemic framework, and consistent language from which to explore why OC efforts fall short of their intended goals. Given the lack of a commonly accepted definition, the remainder of this dissertation follows the description for OC failure proposed by Decker et al., (2012. p. 41): "a project or strategy that was formulated and not implemented, or one that was implemented but with poor results (e.g., missed schedules, expected value not reached)."

Using this definition, the question that remains is why OC failure happens with such a high rate of frequency. The research exploring this phenomenon has produced several common themes. Among the most common are individual and organizational readiness for change (Holt et al., 2007; Weiner, Amick, & Lee, 2008) as well as individual resistance to change (Andersson, 2015; Alas, 2008). Other factors focus more on the actions of leaders to plan and execute change. These include organizational alignment (Ravishanker, Pan, & Leidner, 2011), poor change management planning (Karp & Helgo, 2008), and faulty implementation planning (Beer, Eisenstat, & Spector, 1990). Amernakis and Bedeian (1999) provided the foundation for several attempts by researchers at developing OC models with their categorization of all change effort challenges into one of three classifications: context, content, and process. Decker et al., (2012) proposed that the success or failure of OC initiatives stems from six factors: decision making, risk analysis/assessment, organizational culture, organizational alignment, readiness to change,

and change management. Weaknesses in one or more of these domains increase the probability that the OC effort will fail.

As prevalent as claims of change failure appear to be in the literature, some scholars argue that there is little empirical evidence to support the 70% statistic that researchers frequently cite. Hughes (2011) conducted an analysis of the process used by Kotter (1996), Beer and Nohria (2000), Hammer and Champy (1993), and Senturia et al. (2008) to determine how these authors derived their quantitative data. Hughes (2011) asserted that each of the researchers investigated used rhetoric and inconclusive evidence to make their claims of 70% failure rates in change initiatives.

Fortunately, other articles provide a better scientific basis for observations that OC is difficult and prone to failure. Smith (2002) conducted an analysis of 49 separate studies carried out by a variety of authors and organizations aimed at a broad spectrum of change types and industries. The most successful category of change identified by Smith (2002) was strategy deployment, with a median 58% success rate based on a total sample of 562 organizations spanning three separate studies. The least successful type of change initiative based on Smith's (2002) research was culture change initiatives. Three studies focused on this kind of change effort surveying 225 respondents revealed a success rate of only 19%. Likewise, Cândido and Santos (2015) presented a similar summary of quantitative evidence from surveys documenting the failure rates in efforts ranging from failed quality initiatives (90%) to joint ventures (61%).

In spite of the justified criticisms outlined by Hughes (2011), the weight of evidence should provide organizations with a note of caution to understand the challenges that have historically plagued change efforts. A strong case exists in the literature indicating that the more transformational the change, the greater the probability that the initiative will fail to meet all of

its intended objectives (Smith, 2002; Cândido & Santos, 2015). The section that follows takes a deeper look into the literature focused on transformational change, what makes it different from other types of change, and why transformational change efforts have the highest failure rates.

Transformational Change

Organizational transformation (OT) is a unique form of change initiative that represents a more profound undertaking than routine modifications to company operations. Porras and Silvers (1991) first introduced OT as a type of change effort designed to alter organizational beliefs, vision, and mission. Romanelli and Tushman (1994) defined OT as change affecting corporate culture, structure, strategy, control systems, and power distribution that are vital to organizational survival. Newman (2000) refers to OT as second order change that is radical and that fundamentally alters the company. Edwards (2005) distinguished OT as a change that redefines a company's identity and function.

Given the studies by Smith (2002) and Cândido and Santos (2015) that concluded transformational change initiatives have the highest rates of failure, it is essential that corporate leaders understand the attributes of OT and the strategies that can increase chances for success. Alas and Vadi (2003) recommended leaders cultivate a culture of learning and enhanced capacity to adapt and implement change. Bouckenooghe, Devos, and Van (2009) suggested that successful organizational transformation depends on cultivating and leveraging interpersonal relationships at all levels of the company. They further argued that leaders need to assess the organization's change climate, readiness for change, and change processes before launching an OT initiative.

Organizational Change Management

The intersection of the growing need for competency in OC and the consistent failure rate in change initiatives has provided the catalyst for a growing discipline of methods and processes to guide the change process. OC management (OCM) has emerged as a defined discipline and methodology for informing individuals and companies in the best processes for transitioning from a present state to the desired future state (De Graaff & Kolmos, 2009). A majority of the models codifying a framework for OCM are grounded in Lewin's (1951) three phase change theory (Oreg & Berson, 2009). For example, Armenakis and Harris (2002) prescribed an OCM framework that began with diagnosing the organization's readiness for change, followed by implementing and then sustaining the change. However, Victor and Franckeiss (2002) argued that such models are too simplistic, overly academic, and fail to provide organizational leaders with the types of robust processes needed to drive successful change. The authors further criticized the linear nature common to many change frameworks that start with the target end state followed by a sequence of actions to achieve that objective, stating that planned interventions seldom produce the exact intended results. Additionally, the demands of ongoing operations and the unpredictable nature of the internal and external environments require more robust, adaptive, and multi-dimensional approaches to change. Instead, they proposed a flexible, iterative, and emergent process for responding dynamically to change based on five dimensions: direct, describe, define, deliver, and develop.

Other thought leaders have offered approaches to OC that do not follow a prescribed model with the intent to control the change process. Organic change advocates promote the creation of a collaborative environment where grassroots teams identify the need for change and create a range of innovative alternatives to drive the needed improvements. Kotter (2014)

presented an evolution of his eight-step model to promote a dual operating system approach that allows a second, more agile organic process to work in concert with the traditional hierarchical structure. The intent of this method is to accelerate the pace of change by harnessing the insights of the entire employee population with the support and role modeling of the leadership team.

Similarly, social scientists have applied the concepts of chaos theory to the process of OC to provide leaders with another lens for understanding and dealing with change. Chaos theory deals with the study of random, nonlinear dynamic systems. Levy (1994) gave an analysis of the application of chaos theory to the continuous evolution of industries and the complexity of interactions between an intricate web of actors in any supply chain. Chaos theory challenges the concept of long range forecasting due to the high degrees of uncertainty while simultaneously prescribing methods for identifying patterns that leaders can use for building decision rules for short-term forecasts.

Change Implications of Agile and DevOps Initiatives

Software development is a highly complex process that is empirical, complex, and highly variable (Highsmith, 2003). Transforming the processes an organization uses to develop software is a difficult exercise in organizational change, and cannot be accomplished by just replacing one set of tools and techniques for another. Leaders are advised to assess carefully the readiness of their organization to embrace the mindset changes in addition to the new processes required to transition successfully to an Agile model (Nerur, Mahapatra, & Mangalaraj, 2005). Found and Harvey (2007) described the fundamental change that shifting to Agile can have in challenging traditional silos and confronting barriers to communication and collaboration. The authors went further to emphasize the importance of leaders who: communicate a clear and compelling reason

for the transition, convince employees of the need for change, build buy-in, set the example in their behaviors, and objectively measure progress.

The shift to DevOps expands the scope of OC from the software development department in the IT organization to the rest of IT and the company as a whole. Gartner describes DevOps as more than the convergence of development and operations. Rather, it is a philosophy that leads to a culture shift in the entire company focused on the cross-functional ecosystem companies require for value creation and delivery. Gartner estimates that 25% of the Global 2000 will pursue a DevOps strategy by the end of 2016 (Fiampolis & Groll, 2016). Donnelly (2015) confirmed that implementing DevOps goes beyond tools and process, requiring a transformational change to address cultural issues that create barriers to DevOps adoption. The implication to these organizations is significant in light of Smith's (2002) findings that transformational change initiatives addressing culture have the highest failure rates compared to other types of change efforts.

To summarize the findings from the literature related to change from the organizational perspective, the critical themes included:

- Internal and external factors create continuous pressure for OC

- OC initiatives experience a high rate of failure

- Transformational changes are the most complicated and most prone to fail

- Agile and DevOps implementations are transformational in nature, and a growing percentage of the world's largest companies are adopting these models

- Scholars and practitioners have developed multiple models for helping leaders guide OC, however competing viewpoints suggest that successful change must be organic, or that it cannot be controlled other than on a short-term basis

Each of these perspectives added value to the practice of OC and supported by both theory and documented best practices. However, the literature also suggests that leaders have to look beyond the structured aspects of guiding OC to incorporate the perspectives of the individual employees at all levels of the company who both implement and experience the effects of change. Understanding the process individuals go through when change happens and how to successfully handle change can provide leaders with valuable tools to increase the chances for success during significant periods of OC.

<div align="center">**Change from the Employee Perspective**</div>

Individual Change History and Theories

Humans have an inherent set of responses to change, regardless of the context. Boyatzis (2006) offered intentional change theory, arguing that virtually all people have the ability to change, but that they must have the conscious desire to change to navigate the change positively. He described these positive emotions as the key to motivating oneself to engage constructively in the change process. Bandura (1998) in his social cognitive theory added the dimension of self-efficacy, the belief that one can complete a given task or succeed in a challenging situation. Thus the desire to change and the idea that one can change each play a critical role in the employee response to transformational initiatives. This finding runs counter to the assumption that people have an inherently negative response to change (Jansen, 2000). Further research has indicated that it is not the change itself that people resist; it is the consequences of the change (concerns over the inability to perform in the changed environment, insecurity, loss of position or prestige, loss of control) that create a negative response (Dent & Goldberg, 1999; Klein, 1984; Kotter & Schlesinger, 1979). Leaders who have a deeper understanding of how individual employees process change will have a significant advantage in addressing employee resistance to change.

Employee Resistance to Change

An organization's employees can view change from a variety of perspectives on a spectrum from positive to negative. Some people thrive in a changing environment and see it as an opportunity for growth. Most studies show that the instinctive response is to resist change because of the disruption to existing paradigms and processes that employees use successfully to complete their work (Battilana & Casciaro, 2013). Employees continue the resistance response for a variety of reasons, even though employers view the ability to adapt is viewed as a positive attribute (Oreg, Vakola, & Armenakis, 2011). Research has provided deeper insights into the instinctive response to resist change. Clarke (2008) cited reasons such as fear of the unknown, fear of failing to succeed in the post-change environment, loss of control, and trust issues among others. Shin et al. (2012) found that in addition to disrupting comfortable routines, change often had an adverse influence on social relationships. Other reasons discovered in the literature include misalignment of the results of the change to employees' self-interests, poor communications describing the purpose and value of the change, and inadequate resources to ensure the success of the change (Adcroft et al., 2008; Armenakis et al., 1993).

Scholars describe employee resistance to change from the perspectives of their cognitive, emotional, and actionable responses (Armenakis et al., 1993; Bouckenooghe et al., 2009; Oreg et al., 2003). Mariotti (1996) described responses that included confusion, criticism, denial, feigned compliance, silence, and even sabotage. This list illustrates that resistance can be both active and passive. The response to change is not static; it evolves over time following the announcement of the change. Perlman and Takacs (1990) provided a detailed ten stage emotional process that employees traverse during a significant change that begins with equilibrium, denial, and anger, and then evolves to resignation, openness, and readiness after passing through the depression

27

stage. The classic change curve or S-curve graphical depiction of this evolving response to change was pioneered by Schneider and Goldwasser (1998), many subsequent authors providing their representation of the change process. Given the natural human response to change that is inevitable in many employees during the change, it is incumbent upon leaders at all levels to understand the individual change curve process and to ensure that employees are prepared for the change to shallow out the bottom of the change curve.

Employee Readiness for Change

Employees are central to the OC process (Porras & Robertson, 1992). Many researchers assert that change efforts fail due to leaders underestimating the importance of the role individuals play in implementing change (Armenakis, Harris, & Mossholder, 1993). In a survey of the literature focused on employee attitudes toward OC, Choi (2011) found that research aimed at creating employee readiness for change to be a predominant theme as a response to the resistance phenomenon. The scope of the literature on readiness spanned definitions, processes, and precursors. Readiness in this context refers to an employee's belief that the impending change is needed and that the individual in question views themselves as possessing the capacity to integrate successfully into the modified environment (Armenakis et al., 1993; Holt et al., 2007). Bouckenooghe et al. (2009) developed a scale that assessed employee readiness for change from the mental, emotional, and behavioral responses to change. Their research yielded an expanded understanding of change readiness to include the organizational climate for change, change processes, and employee reactions to change. The consensus in the literature is that employees who are prepared and ready for change are more likely to support the change initiative (Vakola, 2013).

Vakola's (2013) article continued with a recommendation for approaching a readiness program in anticipation of OC efforts. The process began with an assessment of the current level of readiness at the individual, group, and organizational levels. Leaders would introduce measures to increase readiness in a sequence of steps with the goal of increasing personal investment in the change by company employees. Vakola (2013) provided recommendations for building readiness at the strategic, mid-management, and individual levels, while encouraging organizations to create a culture of change readiness versus a ramp up process that must be started over with each new change. An environment of trust was identified as the most critical factor in creating readiness for change (Oreg et al., 2011). Studies show that high levels of trust positively correlate with increased acceptance and willingness to embrace and support change (Wanberg, Kanfer, & Banas, 2000; Coyle-Shapiro & Morrow, 2003; Kiefer, 2005). Trust can be built through open two-way communications, providing accurate and timely information, providing transparency on the reasons for the change process, and encouraging employee involvement in decision-making (Butler, 1991; Whitener et al., 1998).

Organizational Citizenship Behavior

On the opposite end of the spectrum from employee resistance to change are the employee behaviors that support and enable organizational transformation. For companies to succeed it requires individuals at all levels to be willing to go above and beyond their regular duties. Wen-Hai, Feng-Hua, and Chih-Kai (2012) concluded that same organizational commitment was the most critical attribute influencing the attitudes of employees regarding OC. Many scholars have turned to the characteristics of OCB as initially offered by Organ (1988) as a means to measure the level of an individual's organization commitment (Allen & Rush, 2001). OCB is grounded in social-exchange theory initially introduced by Homans (1958). This theory

29

describes the social exchange of something of value between two or more individuals. Self-interest is a key theme of social-exchange theory, and the exchange can fulfill both economic and psychological needs. OCB focused on the intrinsic rewards employees perceived in exhibiting behaviors benefitting the organization that went beyond their monetary compensation and job description. Podsakoff et al. (2000) summarized the discretionary behaviors initially proposed by Organ (1988) and then enhanced by additional research to include: helping behaviors, organizational loyalty, corporate compliance, individual initiative, sportsmanship, civic virtue, and self-development. These responses reflect positive attitudes toward the organization and job satisfaction, which subsequently lead to positive contributions to OC (Avey, Wernsing, & Luthans, 2008).

Wen-Hai et al. (2012) recommended frequent interaction between leaders and employees to discuss change initiatives openly to reduce fear and uncertainty regarding the change, and to increase the positive attitudes that lead to increased organizational commitment and OCB. Yoon's (2009) research also identified a correlation between OCB and improved employee performance, creating an additional incentive for leaders to engage with staff using the leadership styles that have been shown through research to enhance follower OCB. Carter et al. (2012) provided additional evidence using a quantitative study of companies in the service industry connecting TL behaviors, increased employee performance, and high OCB during periods of OC.

The reasons employees exhibit OCB can be purely altruistic as intimated by Organ (1988), but more recent research indicated that the motives for demonstrating OCB can also be driven in part or entirely by more self-centered objectives (Bolino, 1999). In fact, some scholars have criticized early discussions of OCB's definition as being predisposed to an assumption that

these behaviors were being driven solely out of loyalty and commitment to the company

(Niehoff, 2000). Organ (1997) arrived at similar conclusions nearly a decade after his original

work, promoting a more neutral interpretation of OCB intent. Williams and Anderson (1991)

extended Organ's (1988) work to address this concern with a scale that measures and

distinguishes OCB behaviors driven by a commitment to the organization (OCBO) contrasted

with OBC motivated by internally focused goals such as recognition, promotion, and influence.

To summarize the findings from the literature related to change from the employee

perspective, the critical themes included:

- Resistance to OC is a typical employee response

- Organizations can anticipate the responses to change and engage employees in a
  readiness process that can mitigate the resistance response

- The ultimate objective is to foster an environment that leads to high OCB among
  employees that goes beyond readiness for change to engaging and contributing to the
  change process

Understanding how employees respond to change and exploring methods for moving

employees from resistance, through acceptance, to active engagement is the ultimate goal in a

strategy for successful OC. However, this process does not happen accidentally, nor can

organizations depend solely on organic efforts to affect the change that is needed. Inspiring

employees to move from resistance to OCB requires leadership at multiple levels of the

organization. The final section of the literature review focuses on the role of leadership in the OC

process.

Leadership History and Theory

      The interest in leadership has existed since the beginning of recorded history. Discussions of leadership can be found in ancient Greek literature and even earlier in the Hebrew writings that form the basis of Jewish and Christian scripture. The formal study of leadership and management is a more recent phenomenon, beginning in the early 20th century (Yukl & Van Fleet, 1992). This section presents a chronology and description of various leadership theories as they evolved over the late 1800s to present day. Figure 2 provides a timeline depicting when each of the major theories began to emerge in the body of literature.
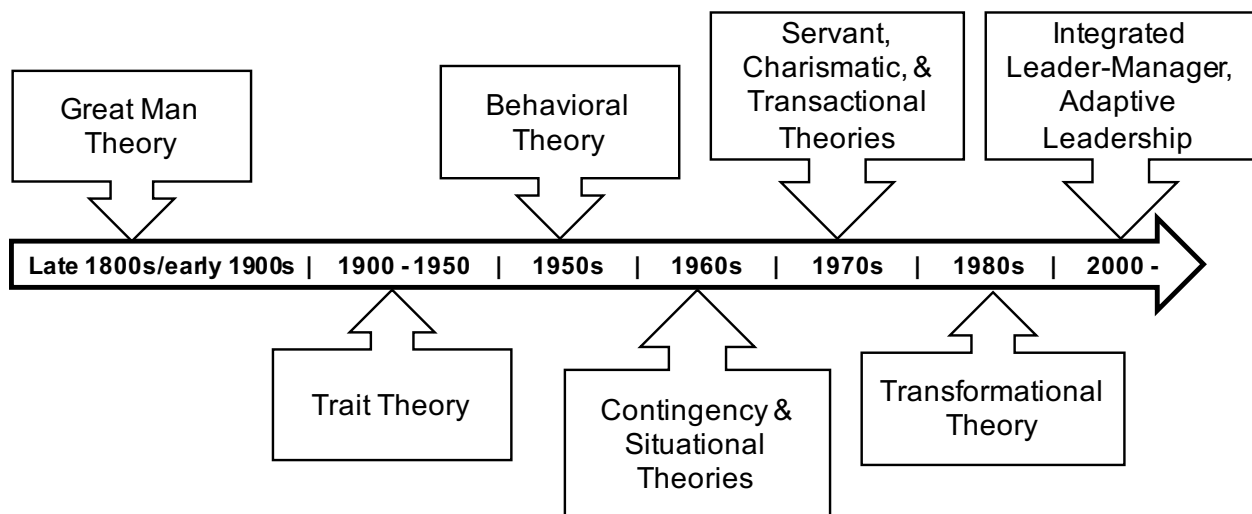
Figure 2. A timeline of the major leadership theories found in scholarly literature in the 20th and 21st centuries.

      Thomas Carlyle (Carlyle, 1907) popularized one of the earliest formal theories regarding leadership. Great man theory held that leaders are born, not made. Carlyle observed from the history of great leaders that leadership traits appeared to pass through generations from father to son. This conclusion ignored the fact that throughout most of history to that point, the social norms of most cultures dictated that only men (with few exceptions) were able to hold positions

of leadership. A parallel tradition believed in the passing of leadership responsibilities from one generation to the next in the same family line. Herbert Spencer in 1860 provided the first argument against great man theory, arguing that leaders were the product of the environment and society in which they lived.

The next shift in leadership theories come in the form of trait theory. Galton (1869) first proposed that leaders possessed certain traits that were inherent, and this theory became the focus of researchers through the late 1940s. Stogdill (1974) proposed in one of his later works that leaders possess inherent qualities that provide them with the ability to lead. Examples of these traits include decisiveness, assertiveness, adaptability, and self-confidence. McCall and Lombardo (1983) extended Stogdill's theory by adding the necessity for additional attributes such as interpersonal skills, emotional stability, and intellectual strength. Eventually, trait theory fell out of favor as critics argued that combinations of traits are only useful in specific situations (Hughes, Ginnett, & Curphy, 1996; Yukl & Van Fleet, 1992).

Behavior leadership models such as role theory supplanted trait theory. Skinner (1938) first outlined the characteristics of behavioral leadership and is considered by many to be the father of this theory. Biddle (1979) offered that leaders model patterns of behavior associated with roles or social positions that carry expectations of behavior. On the heels of trait theory came a variety of contingency theories arguing that there is no one right way to lead and that leaders must adjust their styles to particular circumstances. Examples of contingency theories include Fiedler's contingency theory, situational leadership by Hershey and Blanchard (1996), and path-goal theory by House (1971). House (1977) also introduced charismatic leadership six years later. Blake and Mouton (1964) expanded the topic of contingency theory by introducing a

managerial grid of leadership styles such as laissez-faire that could be used based on the situation and the intersection of concern for people and concern for production.

The 1970's saw the emergence of transactional leadership theories that focused on the mutually beneficial relationship between the leader and the follower. It is transactional in that leaders use the power of their position and control over organizational resources to reward employee performance and elicit desired employee behaviors. The most often referenced transactional model is the Leader-Member Exchange (LMX) theory (Dansereau, Graen, & Haga, 1975; Graen, 1976; Graen & Cashman, 1975). LMX observes that leaders develop exchanges of different quality levels with subordinates. Those with high-quality exchanges have more interactions with the leader and better assignments.

A parallel theory that also emerged in the 1970s was servant leadership. First coined by Greenleaf (1970), servant leaders govern from their position of earned authority gained through trust and respect as opposed to leaning on their formal authority and title. The servant leader demonstrates genuine care for their subordinates and focuses on ensuring followers have everything they need to do the best job possible. Servant leaders frequently use encouragement and support to solicit higher performance. They also frequently delegate responsibilities and decentralize decision making.

The next evolution beyond transactional leadership was transformational leadership (TL), which also evolved from charismatic leadership theory. Introduced by Burns (1978), TL involves a cooperative relationship between leader and follower where both work together to innovate and implement change to achieve an inspiring vision. Leaders exhibiting TL behaviors inspire followers through their vision, authenticity, care for each individual, and a commitment to follower achievement. Barling, Christie, and Hoption (2011) observed in 2011 that at that time,

34

TL was the most studied form of leadership to-date. A later section will address this theory in more detail.

Scholars have continued to increase the body of knowledge on approaches to leadership beyond TL. Gardner (1990) posited that organizations need integrated leader-managers who possess the attributes of both leadership and management and can synthesize both roles as circumstances require. The author described integrated leader-managers as politically astute, outward focused, concerned about vision and values, all while seeking to limit their influence to their own group. Another example of contemporary leadership theories is the adaptive leadership model pioneered by Heifetz (Heifetz, Kania, & Kramer, 2004). Heifetz described leadership as a process instead of a set of traits possessed by the leader. Leaders provide focus to the present problems being faced and engage stakeholders to collaborate towards a solution through debate and innovative thinking. The model leads to non-threatening strategies for change given the focus on broad participation and inclusive processes.

Change Leadership

Successful OC depends on sound leadership at multiple levels and by both formal and informal leaders. Anderson and Anderson (2011) promoted what they described as conscious change leadership as the discipline necessary to effectively guide change. They chose the term conscious because change leaders cannot operate on autopilot: they have to have increased self-awareness to bias, mindset, and worldview. Conscious leaders understand that their default views influence their decisions and sway their perceptions of outcomes. This increased self-awareness is the first step leaders take toward implementing best practices of leadership that foster an environment ready for transformational change. Behaviors of the self-aware, conscious leader include asking for input, open and frequent communication, co-creation versus command and

35

control, empowering others, openly sharing feelings and admitting mistakes, setting the example, and active listening.

Mehta, Maheshwari, and Sharma (2014) conducted an empirical study examining the role of leadership in guiding successful change. Their findings showed that a balance of task-focused and people-focused behaviors was necessary to lead change initiatives. The reminder for leaders is that while more inclusive leadership styles are move effective when managing transformational change efforts, teams must still accomplish tasks where some degree of transactional process is required. Brown and Eisendardt (1997) found that successful change leaders are those who have the ability to clearly communicate priorities and responsibilities while being open to adjusting the plan as the circumstances require. Leading change also requires a relentless focus on business details at multiple levels of the organization while engaging in the softer skills that inspire employees, encouraging cross-organizational collaboration, and decreasing resistance to change (De Smet et al., 2012). Scharmer (2008) described leading change as a careful balance between *attention* and *intention*.

One of the most significant contributions of leadership during periods of OC is to positively influence employee attitudes of resistance, the most commonly cited reason for the failure of change initiatives (Bass & Riggio, 2006; Pawar & Eastman, 1997). Multiple factors drive the natural resistance response to change, increasing the probability the employees will respond negatively to OC (Clarke, 2008). Goodeve (2008) provided strategies leaders can use to lower resistance while fostering acceptance and buy-in by employees to the change process. Fundamental among Goodeve's (2008) recommendations were to place great emphasis on frequent open communications. Additionally, leaders should allow time for employees at all levels to adjust to the change and how it will affect each person individually. Wax (2011) added

36

the importance of soliciting and incorporating feedback from employees early and throughout the change process. Hales (2011) stressed the importance of practicing straight talk and truth telling when communicating about the changes as means to build employee trust.

Roles and behaviors of leaders during change. Leaders play a vital role in setting the stage for change, and can positively influence how employees respond to change through their behaviors extending from how they view their role during change. Higgs and Rowland (2005) conducted qualitative research incorporating over 70 stories of organizations undergoing significant change. They identified three perspectives of leaders that influenced their predominant behaviors during change. Shaping behaviors extend from leaders who see themselves as controlling change. They drive the change process, establish the vision for the desired end state, set the example for others to follow, and see it as their personal mission to ensure the change is successful. Framing behaviors establish context for the change but do so while inviting others to add value to the change direction and process. These behaviors create an overall framework and guidance for the change but empower others with the latitude to determine the details of change implementation. A third role observed of leaders during change is creating capacity. This role describes the behaviors leaders exhibit that lead to followers growing in their ability to thrive during change. They accomplish this outcome by investing in training that helps organizations prepare for change, as well as providing direct feedback and coaching during change. Higgs and Rowland (2005) found that excessive shaping behaviors had a negative influence on employee's acceptance of change, while framing and capacity creating increased the level of buy-in and participation.

Higgs and Rowland (2005) observed that the leaders who exhibited framing and capacity creating behaviors while limiting shaping behaviors also had high levels of self-awareness. This

finding aligns with a large body of research confirming the positive outcomes of leader self-awareness on employee attitudes and performance (Avolio & Gardner, 2005). Changes affect leaders as well as employees, and increased self-awareness can not only help leaders take the roles that have been shown in the literature to influence employees positively during a change, but can also lead to monitoring their own emotional responses to change. Higgs and Rowland (2010) concluded that self-awareness by leaders was a critical success factor in the successful implementation of change.

Role of mid-level and front-line manager during change. The influence of leadership during periods of OC differs based on the position of the leader in the company structure. Wang and Howell (2010) defined leadership at the unit level as those individuals focused on the reasons driving the change initiative, the overall vision and direction of change, the goals to be achieved by change, and the actual performance of the unit during and after change. In this context unit leadership and senior leadership are synonymous. However, it is middle-level leaders and frontline supervisors (individual level leaders) who have direct responsibility for individual performers who must embrace and implement the changes prescribed by unit-level leaders. Given the body of research that has highlighted the role of employee resistance as a leading cause of failure in change initiatives, these individual level leaders have the greatest potential to influence follower's response to change. Individual level leaders can provide personalized support to employees struggling to adapt to the change (Bass, 1999). One way leaders gain employee buy-in to change is to challenge them to contribute better ways to perform tasks in the context of the transformed environment (Antonakis & House, 2013), leading to an increased sense of ownership in the change (Groves, 2005). Carter et al. (2014) concluded from their study of middle-level leadership during OC that individual level leaders must balance their

focus between the unit and the individual members and that companies would be wise to invest in the development and training process for these leaders. Unit leaders get to cast the vision of change for the company, but it is individual level leaders who have the relationships and the direct influence with employees who can play the most critical role in ensuring that the change initiative is successful.

   Role of informal and situational leaders during change. In addition to unit and individual level leaders in the organization, there are other employees who hold no formal leadership titles, but who are critical to the success of change initiatives. These informal and situational leaders exist in unseen networks that employees use to share information, solve problems, and experience personal growth. Townsend (2015) referred to the most influential members of these networks as critical connectors. Critical connectors have this influence because of the trust and respect they have gained from their peers. They have demonstrated their knowledge, insight, reliable advice, and sound decision making over the course of hundreds of small interactions over time. Much like the tagline from 1980's E.F. Hutton commercials, when critical connectors speak, other employees listen.

   Organizations historically overlook the hidden asset of the critical connector. Townsend (2015) described an anecdotal account of a company that separately surveyed leaders and employees to have them identify the most influential members of the organization. When the author compared the results, only three names were common to both lists. Townsend (2015) recommended organizations use simple surveys to identify the critical connectors in the company. Once identified, these influencers can be invited to participate in an advisory team to provide feedback on proposed changes and the communications that are developed to keep employees informed. Leaders must understand that the influence wielded by these informal

leaders can be positive if constructively engaged, but those same leaders can contribute

exponentially to change resistance if their concerns are not heard and addressed. It is in the

organization's best interests to incorporate a process to identify, engage, and empower critical

connectors as part of the overall change initiative strategy for success.

Transformational Leadership

Researchers have devoted significant effort studying leadership theories and approaches

that best prepare leaders to guide OC. Given the need for a more collaborative, communicative,

and empowering style of leadership to reduce employee resistance to change, considerable focus

has centered on the relationship between TL and OC. Transformational leadership theory was

first described by Burns (1978) and was expanded by Bass and Aviolo (1994) to include the

characteristics of vision, inspiration, intellect, and individual consideration. Since Burns' (1978)

initial work, TL has been the focus of more research than all previous leadership theories

combined (Barling, Christie, & Hoption, 2011). Irshad and Hashmi (2014) concluded from their

study that TL behaviors in managers had a positive correlation to employee OCB, especially

when mediated by strong emotional intelligence. Bass (1990) confirmed that TL led to

employees looking beyond their own self-interests to the greater good of the organization. Other

researchers have explored the effectiveness of TL in guiding OC (Pawar & Eastman, 1997; Bass

& Riggio, 2006). The positive effect on employee resistance is understood given the studies

showing that TL led to positive attitudes and increased performance among employees,

especially during OC (Bass, Avolio, Jung, & Berson, 2003; Carter et al., 2013; Nemanich &

Keller, 2007).

TL theory is not without its critics. van Knippenberg and Sitkin (2013) argued that the

theory lacks a precise definition, has an inadequate causal model, and flawed measurement

instruments. Eisenbeiß and Boerner (2013) warned of an unhealthy dependency by followers

upon the leader as a potential negative side effect of TL behaviors. Scholars have expressed

further concerns regarding the potential abuse of power can potentially occur with

transformational leaders given their strong, charismatic influence on followers (Hall, Johnson,

Wysocki & Kepner, 2002). Despite these and other criticisms, the overwhelming majority of

scholarly research into the attributes and effects of TL have concluded that its positive benefits

are well worth the limited risks for leaders, especially when guiding major transformational

change initiatives.

Leadership Training

Based on the evidence from the body of literature supporting the benefits organizations

experience through the adoption of a transformational style of leadership (Sivasubramaniam,

Murry, & Avolio, 2002), the next challenge to overcome is hiring and developing leaders who

embrace these behaviors. Researchers have conducted multiple studies to determine if TL can be

taught, leading to a change in leadership behaviors among participants. Bass (1998) concluded

from the results of numerous case studies that organizational leaders can provide employees with

TL training, producing demonstrable results. Studies such as those conducted by Popper,

Landau, and Gluskinos (1992) showed positive improvement in organizational commitment by

followers after leaders completed TL training. Avolio and Bass (1994) studied the results of tests

conducted before and after the completion of TL training by hundreds of participants. Their

findings showed a definite increase in TL behaviors following the training program among the

learners responding to the post-training survey. Barling, Weber, and Kelloway (1996) concluded

from their study that followers' perceptions of leaders who had completed TL training

significantly improved, their commitment to the organization increased, and overall financial

performance of their business unit improved. Similar results were reported in additional studies by Dvir et al. (2002), as well as Parry and Sinha (2005).

Even with the positive results of multiple studies showing that TL can be training, critics argue that more research is required to confirm the correlational outcomes of this training. Sonungro (1997) cited the lack of follow-on evaluations by organizations to validate that TL training produced tangible improvements in company performance. Lynham (2000) similarly argued that scholars had not adequately established the connection between leadership training and individual expertise as well as organizational performance through empirical research.

The calls for additional studies to substantiate the measurable outcomes of TL training have led to further studies to strengthen this area of the body of knowledge. Parry and Sinha (2005) conducted field research that concluded leaders can improve their performance along each of the five dimensions of TL through completion of related training. They found that improvement was achieved in all five areas even when development plans established after training focused on only one or two dimensions. Brown and May (2012) confirmed through their study that an extensive training and development effort led to substantial increases in TL behaviors and contingent reward among participating front line supervisors. Dvir et al. (2002) found that transformational leaders post-training had a positive influence on follower performance, as well as halting any decline in motivation or morale. Additional insight from Conger and Benjamin (1999) suggested that development programs for transformational leaders include hands-on experiences supported by mentors and active feedback mechanisms in addition to formal training.

To summarize the findings from the literature related to change from the leader's perspective, the critical themes included:

42

- Leaders play a crucial role in the planning and implementation of OC

- Mid-level and front line managers have the most direct influence on employee's response to OC, followed closely by informal and situational leaders

- Transformational leadership has a positive effect on employee response to change, and these behaviors can be taught

Summary of the Literature Review

The factors that lead organizations to undergo transformative change initiatives are growing exponentially. Moore's Law, (Moore, 1965), originally written to describe the doubling of processor power every two years, has corollaries in every aspect of the business environment. Technology capabilities previously reserved for the largest corporations are now available to the smallest startup (Diamandis & Kotler, 2015). Increasing competition, changing demographics, new regulatory requirements, and global connectivity are just a few of the factors that are increasingly forcing companies into a state of continuous, often transformative change (Chung & Hsu, 2010). The challenge this creates for corporate leaders is that the body of evidence points to the fact that OC is hard and prone to failure. Researchers such as Cândido and Santos (2015) have demonstrated empirically that transformative change efforts fail more frequently than incremental change initiatives. It is into these headwinds that leaders must navigate themselves, their employees, and the organization through best practices that demonstrate positive results toward increasing the probability of successful change.

The overwhelming evidence from the literature presented in this review is that the success or failure of a change effort comes down to the human factor. Organizations are a reflection of the people they employ, from the operations floor to the executive suite. The most common cause cited for failure in transformational change initiatives is the reluctance to change

43

by organization members (Van Dijk & Van Dick, 2009). Although leaders frequently assume that it is the followers who are at fault for resisting change, leaders are people too, and just as susceptible to the concerns over loss of job, loss of control, and loss of ability to succeed in the changed environment as line employees (Clarke, 2008).

The difference for leaders is that along with the leadership role comes the responsibility to rise above personal fear to pursue the best interests of the company, its employees, its customers, and other stakeholders. The literature in this survey demonstrated that leaders have the opportunity through their choice of leadership behaviors to influence how employees perceive and respond to change. Trust, transparency, and active involvement of employees in the change process increases engagement and decreases resistance to change (Oreg et al., 2011). Continued investment in and respect for employees leads to increased levels of OCB, an antithetical mindset to the attitudes that result in change resistance. Irshad and Hashmi (2014) demonstrated through their empirical study that TL behaviors have a direct positive correlation to increasing OCB among employees who work with transformational leaders.

The conclusion from the literature reviewed is that the body of evidence connecting TL with increased success in OC initiatives appears to be gaining momentum. The focus of the research methodology described in the following section is to conduct a quantitative study that will extend the existing research and study variables related to OC, employee behavior, and leadership approaches that scholars have not fully examined. Each element of the methodology will be set against the backdrop of Agile and DevOps change initiatives in large U.S. based corporations.

CHAPTER 3. METHODOLOGY

Introduction

The purpose of this present study was to explore the relationship between the presence of TL behaviors among front-line managers and the employee attributes that have been shown to improve the success rate of OC initiatives. Specifically, this research effort used a quantitative, non-experimental approach to determine if a significant statistical relationship exists between TL behaviors of front-line leaders as the independent variable, with readiness for change and organizational citizenship behaviors as dependent variables. An electronic survey assembled from two existing instruments designed to measure each of the selected variables collected the data for this study. I provided the survey to an online opt-in panel consisting of full-time IT professionals working for U.S. based companies with 500 or more employees engaged in Agile and DevOps initiatives. The remainder of this chapter describes the study design in detail. Topics covered include: the setting selected for data collection, the sample size surveyed and how that target was derived, the instruments that were used to construct the survey, methods used for collecting the data, the analytics that were used to examine the data, implications of the results and how they addressed the research hypotheses. The chapter concludes with a description of methods selected to ensure the validity and reliability of the survey data, as well as the measures used to make sure that this research effort met the highest ethical standards for scholarly research.

Design and Methodology

The design of this study was based on a correlational, quantitative, non-experimental approach to identify any statistically significant relationships between the independent variable and the two dependent variables (Creswell, 2009). Pearson's *r* correlation and linear regression

analyses were used to examine the relationship between TL behaviors of front-line managers, readiness for change, and employee OCB. A quantitative explanatory methodology was appropriate for this design due to its strong fit for examining the complex relationships between multiple interrelated factors that exist when a company launches an OC initiative (Goldkuhl, 2012). Quantitative methods are also useful for generalizing the results from analyzing smaller groups and applying the findings to broader populations with similar characteristics (Swanson & Holton, 2005).

Population and Sampling

The population for this quantitative study was IT professionals working full-time for U.S. based companies with more than 500 employees. As an additional qualifier, survey participants were asked to attest that how they perform their assigned work has been or will change in the future as the result of a recent or ongoing implementation of Agile or DevOps. The panel aggregator conducted random non-probability sampling from the opt-in responses based on the specified targeting criteria. Online opt-in surveys are a frequent topic among the research community, with many arguing that the increased risk of non-sampling errors call into question the ability to make a statistical inference of survey results to the larger target population (AAPOR, 2013). The AAPOR (2013) report further asserted that opt-in panels are a form of convenience sampling, and require additional measures to address potential biases to increase their usefulness and accuracy. One method the authors recommended to improve the quality and reduce bias in non-probability sampling is through sample matching techniques such as quota sampling. Sample matching compares a sample to a control group based on one or more characteristics. Lavrakas (2008) described quota sampling as ensuring a non-random sample represents key characteristics of the overall population by sampling proportional numbers based

on the same characteristics. For example, if the known population has 60% men and 40% women, the opt-in survey would continue collecting responses using categorical indicators to ensure that the surveys collected matched this gender demographic. The U.S. Bureau of Labor Statistics (2016) indicated that in the IT professions within the category of Computer and Mathematical Occupations, the total population was estimated to be 4.1 million. The report stated the percentage of women was estimated at 24.28%, with the percentage of non-white ethnic workers totaling 29.45%. Using this information as a reference point, this study used quota sampling to ensure that 25% of respondents are women, and 30% self-identify as non-white ethnic individuals.

Recognizing the body of literature that states sample size calculations for nonprobability samples do not carry the same weight as probability samples, the task remained to determine a sample size requirement for this study. The required sample size for this research design used the same calculation as would be needed for a traditional probability sample. Therefore, this study used a sample frame of 384 participants based on an unknown population size, a confidence level of .95 (alpha), and a confidence interval (power) of .05. The alpha risk or level of significance describes the probability of rejecting a null hypothesis that is true based on the results of the statistical analysis (Type 1 error). An α of .05 is typical (Moore & McCabe, 2006), and expresses a 95% confidence level that the results of the analysis and their corresponding conclusions are valid. Finally, the power of the test or beta risk indicates the likelihood that a false null hypothesis is accepted (Type II error). The power level of .95 factored into this sample size calculation yielded a 95% probability that the false null hypotheses would be rejected.

This calculation was confirmed using a post-hoc, one-tailed t-test using G*Power 3.1.9.2. Figure 1 shows the power of a 384 sample frame is sufficient to represent an unknown

47

population. The effect size was 0.3 (medium) as recommended by Cohen (1988). The α error probability (Type 1) was set to 0.05 (Moore & McCabe, 2006), and the sample was set to 384. These settings resulted in a calculated power for this sample as 0.9999859 (1-β error probability). The proper z-score of 1.96 is also shown as the critical t value (Faul, Erdfelder, Buchner, & Lang, 2009)
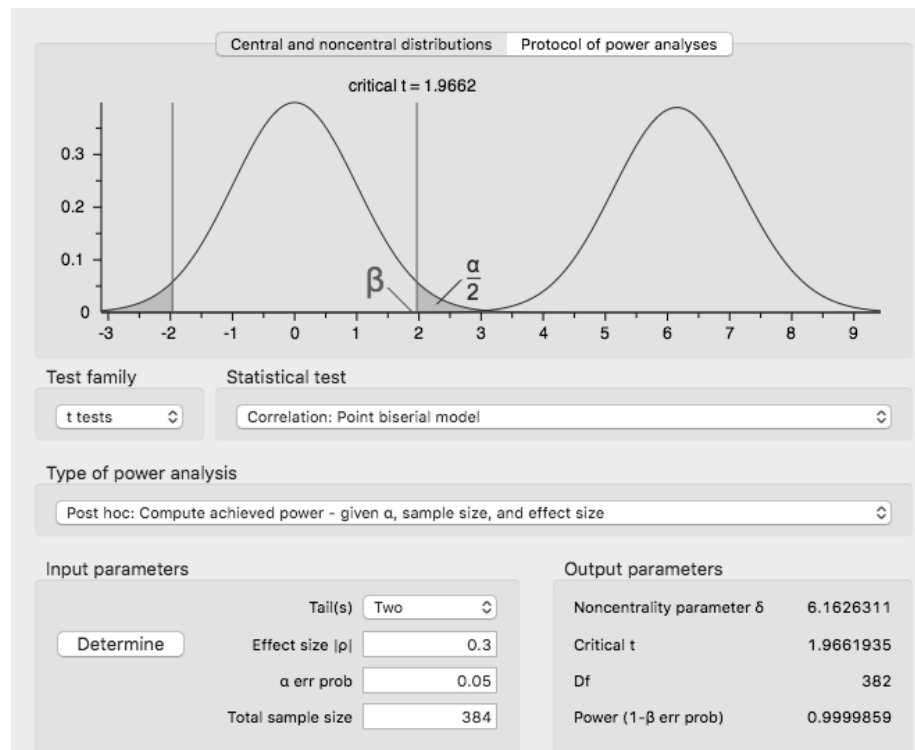
Figure 3. G*Power 3.1.9.2 configuration for correlation: point biserial model t test using an effect size ρ = 0.3, α = 0.05, and n = 384. 1-β error probability calculated by G*Power to be 0.9999859. [Used with permission.]

Setting

The setting for this study was an opt-in panel of IT professionals working full-time in U.S. based companies with 500 employees or more. The U.S. SBA and the U.S. Census Bureau classify companies with 500 or more employees as large businesses (Thomas, 2012). The challenges associated with organizational change increase in complexity as companies grow

larger (Kessler et al., 2012), creating the focus on large companies for this study. The survey tool gave respondents a qualifying question confirming that their work activities have changed as a result of their company's adoption of Agile or DevOps, in addition to questions confirming the other population parameters. Answers of "no" to any of the qualifying questions resulted in the termination of the survey. Survey respondents were recruited by the panel aggregator Cint, and the online survey managed through SurveyGizmo.

Data Collection

Data collection for this research effort occurred in three stages: preparation, implementation, and verification. The top priority for the preparation stage was the finalization of the panel parameters with Cint, and the creation of the survey with all flow logic and validation features configured to increase the quality of the responses in SurveyGizmo. Examples of these features included checks for multiple submissions, trap questions, and engagement self-reporting questions. Also included in this stage was the process required to obtain direct authorization for use from the instrument authors to use their survey questions in this study. I secured these permissions prior to executing the study. This stage additionally included the acquisition of the tools used in the data collection process. I used a SurveyGizmo account to build, distribute, and manage the survey process. I also acquired and installed IBM SPSS Statistics Premium GradPack 24 for the Mac to perform the analysis on the survey data collected.

The implementation stage included notifying Cint to proceed with the distribution of invitations to their panelists to participate in the study, tracking response rates, and monitoring the data as it came into the online survey management tool. I worked closely with Cint to assess the quality of the data, checking for flat-liners (little variance in responses), response times

49

(checking for participants speeding through the survey), dropout rates, and alignment of the replies to quota targets. Cint continued to distribute surveys to replace bad responses until they reached and exceeded the required sample size of 384 quality responses (400 total responses were collected).

The final stage focused on verifying the usability of the data received from the surveys before conducting the analysis process. Response data was reviewed initially through SPSS for a general assessment of overall consistency and detection of any missing or corrupt data. Next, I validated the population to ensure all survey responses were complete with no missing data and tested for critical assumptions of completeness, reliability (Cronbach's α), principle components analysis (PCA) and normality (histogram, Q-Q plot).

Instrumentation

The study consisted of a survey tool that combined three published survey instruments with written permission for use from each of the authors. The Multifactor Leadership Questionnaire (MLQ 5X) by Avolio and Bass (2004) was used to measure TL behaviors of front-line managers. The scale by Podsakoff, MacKenzie, Moorman, and Fetter (1990) measured the OCB of employees. Readiness for change was examined using the Organizational Change Questionnaire-Climate of change, processes, and readiness (OCB-C, P, R) by Bouckenooghe, Devos, & Van (2009). The survey also included additional categorical data used in the analysis of the resultant data. This section included demographic information of gender and ethnicity to support the quota sampling in addition to age, education, and experience questions. The survey also asked for information specific to their role in IT, and any Agile specific certifications the respondents held.

The Multifactor Leadership Questionnaire Form 5X

The survey instrument that was used to measure the behaviors of TL in front-line managers and senior leaders was the Multifactor Leadership Questionnaire (MLQ) Form 5X by Avolio and Bass (2004). The MLQ has become the de facto standard for measuring TL and has undergone rigorous examination, review, and revision since the original version was produced by Bass (1988) (Javidan & Waldman, 2003; Avolio & Bass, 2004; Avolio, Bass, & Jung, 1999). The MLQ Form 5X is a Likert scale instrument consisting of 45 statements designed to assess the respondent's attributes of transformation, transactional, and laissez-faire leadership attributes (Avolio & Bass, 2004). Participants responded to each statement using the ratings *0=Not at all, 1=Once in a while, 2=Sometimes, 3=Fairly often, or 4=Frequently, if not always.* An example of an MLQ statement is "*I help others develop their strengths*" (individualized consideration).

Organizational Change Questionnaire-Climate of Change, Processes, and Readiness

The Organizational Change Questionnaire-Climate of change, processes, and readiness (OCQ-C, P, R) by Bouckenooghe, Devos, & Van (2009) consists of a 42-item battery designed to examine the success factors related to an organization's ability to engage in significant change initiatives. Although there is a substantial body of literature surrounding the various dimensions related to organizational change (Choi, 2011), there are few validated instruments designed to measure the elements included in the OCQ-C, P, R (Bouckenooghe, et al., 2009). The most viable alternative for measuring readiness for change was the Readiness for Organizational Change Measure (ROCM; Holt, Armenakis, Feild, & Harris, 2007). Concerns with the ROCM were raised by Bouckenooghe, et al. (2009) based on its use of only two organizations to collect the data used to build the instrument, as well as the co-mingling of readiness factors with climate and process factors. For climate of change, the OCQ-C, P, R examines trust in leadership,

51

politicking, and cohesion. In the category of change processes, the instrument provides questions focused on the quality of change communication, participation, attitude of top management toward change, and support by supervisors. Readiness for change questions included emotional, cognitive, and intentional readiness for change dimensions. Participants responded to each statement using a five-point Likert scale ranging from *1=Strongly disagree* to *5=Strongly agree.*

Organizational Citizenship Behavior

The instrument used for measuring OCB was the 24-item scale by Podsakoff, et al. (1990). The statements developed by the authors measured the five behaviors of OCB described by Organ (1988), including altruism, conscientiousness, sportsmanship, courtesy, and civic virtue. Respondents used a seven-point Likert scale with options from *1=Strongly disagree* to *5=Strongly agree* to assess each statement. Examples of questions include "Helps others who have been absent" and "Attend functions not required but that help my company image." Smith et al. (1983) wrote the original statements in the instrument from the perspective of the supervisor viewing the behaviors of their employees. However, following the recommendation of Babcock-Roberson and Strickland (2010) and the precedent of published peer-reviewed articles using this same instrument such as the study by Al-sharafi and Rajiani (2013), for this research participants were asked to answer each question as a self-assessment.

One of the challenges with measuring OCB is a lack of consistency in the taxonomy. Since Organ (1988) first published the conceptual definitions of OCB, the number of scholarly articles exploring OCB has grown exponentially. However, much of the research has been focused on understanding the relationship between OCB and other constructs, as opposed to further validation of the measures of OCB (Podsakoff, MacKenzie, Paine, & Bachrach, 2000). This growing body of research has also expanded the dimensions scholars have identified and

attributed to the concept of OCB. Podsakoff, et al. (2000) identified seven different themes among the published works related to OCB, including helping behavior, sportsmanship, organizational loyalty, organizational compliance, individual initiative, civic virtue, and self-development. Organ et al. (2006) described additional instruments developed between 1983 and 1998 to measure OCB, however the more recent studies were either less reliable or for contexts not appropriate for this present study. Therefore, the scale by Podsakoff et al. (1990) was used for this research effort.

Hypotheses

This correlational, quantitative study examined the relationship between TL behaviors of front-line managers and employee readiness for change and OCB. The survey tested the research questions and hypotheses by soliciting IT professionals employed full-time in large companies engaged in Agile and DevOps initiatives.

The first research question that guided this research was:

- RQ1: To what extent does a relationship exist between TL behaviors of front-line managers and employee readiness for change during Agile and DevOps initiatives?

The hypotheses used to address the research question was:

- $H1_0$: Higher levels of TL behaviors exhibited by front-line managers are not related to higher levels of employee readiness for change during Agile and DevOps initiatives.

- $H1_a$: Higher levels of TL behaviors exhibited by front-line managers are related to higher levels of employee readiness for change during Agile and DevOps initiatives.

The second research question explored by this study was:

- RQ2: To what extent does a relationship exist between TL behaviors of front-line managers and employee OCB during Agile and DevOps initiatives?

The hypotheses used to address the research question was:

- $H2_0$: Higher levels of TL behaviors exhibited by front-line managers are not related to higher levels of employee OCB during Agile and DevOps initiatives.

- $H2_a$: Higher levels of TL behaviors exhibited by front-line managers are related to higher levels of employee OCB during Agile and DevOps initiatives.

Data Analysis

Once the data from the surveys were collected and validated, the hypotheses were tested using multiple correlation analyses between TL and readiness for change and OCB. Correlation examines the linear association between the variables to determine if one variable changes the other (Anderson, Sweeney, & Williams, 2014). As a form of regression analysis, correlations do not provide evidence of cause-and-effect, but they do provide insight into the significance of the relationship that exists between variables. An analysis of variance (ANOVA) procedure using statistical modeling tools was used to examine the correlations. The statistics of interest for this analysis were Pearson's r squared, the adjusted r squared, p-value, and the alpha threshold. For the correlation coefficients, an r value of >.50 indicated a strong correlation between variables. >.3 to <.5 indicated a moderate relationship, while a result of <.3 implied that a small correlation existed between the variables. The p-value indicated the level of statistical significance, with an alpha threshold of 0.05. These statistics of interest were calculated using IBM SPSS version 24.

Validity and Reliability

The Multifactor Leadership Questionnaire Form 5X

The validity of the MLQ Form 5X had a Cronbach's α of .96 (Avolio & Bass, 2004). The reliability coefficients of the leadership factor scales had an overall range of .74 to .94, and significant at $p < .01$. These measurements were derived from over 27,000 responses to the MLQ

in the United States (Avolio & Bass, 2004). Additional studies confirming the validity of the MLQ Form 5X were conducted by Antonakis, Aviolio, and Sivasubramaniam (2003). However, the instrument is not without its critics. Several studies examining the psychometric properties of the MLQ through additional confirmatory factor analysis (CFA) have produced concerns and proposed modifications (Bycio, Hackett, & Allen, 1995; Tejada, 2001). These concerns are mitigated by the overwhelming body of literature based on the MLQ confirming its fit for use in examining TL behaviors of leaders, and in the instrument's history of periodic revisions based on the findings of further research by the academic community.

Organizational Citizenship Behavior

Podsakoff et al. (1990) reported the Cronbach's α for reliability of the instrument for all constructs met or exceeded the recommended level of .70 for the development of new scales (Nunally, 1978). A confirmatory factor analysis (CFA) examined the validity of the instrument, with the results for the Leader Behavior Scale provided in Table 3 of the article on page 118. Table 5 on page 121 listed the CFA scores for the OCB scale. The authors employed several models to indicate validity, including measures such as chi-square and Tucker-Lewis goodness-of-fit index (TLI). The CFA supported the validity of the Leader Behavior and OCB survey questions.

Organizational Change Questionnaire-Climate of Change, Processes, and Readiness

The validity of the three dimensions of readiness for change tested in the OCQ-C, P, R had a Cronbach's α between .69 and .86, $p < .001$ as confirmed through an exploratory factor analysis. The authors attributed part of the variation in the factor analysis to the respondents' connection of cognitive readiness for change with their response to change in general. This was

compared to the emotional and intentional readiness factors that the study examined in relation to specific changes. The reliability coefficients ranged from .68 to .89.

Ethical Considerations

Concerns over ethical implications in the conduct of academic research are a central theme throughout the scholarly process. Adhering to sound, published standards of ethics when performing research activities is essential to protecting the rights of participating individuals and organizations. Conforming to these standards also reinforces the integrity of the conclusions drawn from published research and ensures that extensions to the related body of knowledge can withstand the weight of future scrutiny (Roberts, 2010).

I conducted this study in agreement with the highest standards and expectations for designing and implementing scholarly studies. This quantitative research utilized an electronically administered survey composed of questions compiled from two pre-existing published instruments. I ensured participant privacy, as the survey collected no personally identifiable information (PII) of any kind from any respondents. The electronic survey only permitted multiple choice selections; the data collection technology used enforced a design that presented no opportunities for errant entry of PII. The survey requested respondents to provide categorical data for classification purposes only, and no combinations of categorical choices were traceable to any individual. The data stored in SurveyGizmo did not include any other coding or capturing of metadata as part of responding to the survey. The panel aggregator Cint tracks metadata of panelists to ensure security and quality standards, and to monitor suspicious or invalid responses from any participants. This precaution is a standard feature of all leading panel aggregators. This data is proprietary to Cint, and I did not have access to this information at any time. Cint selected respondents from the target population of panelists through a random

56

sample. The panel aggregator also enforced quotas for gender and ethnicity. At no time did Cint provide individual names, email addresses, or other personal information to me.

I ensured that the potential for harm to survey respondents was negligible. The primary concern was the risk of uninformed consent by participants. To mitigate that risk, a letter of informed consent was provided to all participants as part of the SurveyGizmo response process before the presentation of survey questions. Participants had to indicate their understanding and concurrence with the informed consent information for the survey process to continue. The only other limited risk to respondents was the potential for other individuals to observe the answers to survey questions. I addressed this risk through the detailed instructions for survey participation that respondents were presented with prior to beginning the survey. This guidance stressed the importance of completing the electronic questionnaire in a private setting where others could not view their answers. Respondents also had the option to exit without submitting their answers at the end of the survey. The survey tool recorded responses in the provider's cloud-based application, so no interaction with participating individuals to collect or access the survey data was required. After retaining the survey data for seven years from the completion of this study, I will destroy the original data stored at SurveyGizmo using the vendor's data deletion process. This will be accomplished using a permanent deletion request form available on the SurveyGizmo website. The vendor's process removes the data from active storage as well as all backup copies. I will also destroy the survey data on the MacBook Air used for analysis via a feature in Apple's OS X that permanently erases files in Trash using Department of Defense security standards. I did not identify any other ethical concerns. No actual or perceived ethical concerns emerged after the study.

CHAPTER 4. RESULTS

Introduction

This current study was a quantitative, non-experimental effort to determine if a

significant statistical relationship exists between TL behaviors of front-line leaders in large U.S.

based companies, and the readiness for change and organizational citizenship behaviors of their

IT professional followers, in the context of Agile and DevOps initiatives. This chapter presents

the results of this research to include the demographic characteristics of the respondents as well

as the analysis of the correlation between TL and the two dependent variables OCB and OCQ-R.

Results of assessments for reliability, factor analysis, and normality of the collected data are

reviewed, followed by the outcomes of the Pearson's correlation tests and the linear regression

tests provided by SPSS. The results indicate whether or not a relationship exists between TL of

front-line managers and the OCB and OCQ-R of IT professionals in the selected population.

Chapter 4 presents an overview of the findings of this study.

Data Collection Results

Upon approval to proceed with data collection, I notified Cint to invite qualified panelists

who met the requisite population criteria to begin completing the SurveyGizmo questionnaire

prepared for this study. The questionnaire consisted of qualifying questions to confirm the

participant met the population requirements, the informed consent letter, questions from each of

the three selected instruments, and a set of 10 demographic questions. A total of 620 participants

responded to the survey invitation. Of these responses, 153 were disqualified either because the

participant answered that they did not meet the population requirements, or that they did not

agree with the informed consent letter. These surveys were terminated immediately. A total of 21

participants qualified and agreed to the informed consent letter, but abandoned the survey

process before completing the instrument and demographic questions. Data analytics conducted on the remaining surveys using SurveyGizmo's data cleaning tool resulted in the quarantine of 46 additional responses based on patterns such as straight-lining answers (for example answering all questions with "5") or speeding through the answers at an abnormally fast or slow rate. This refinement left 400 quality responses (85.6%) to use in the analysis process. The total exceeded the minimum of 384 completed surveys needed to achieve a confidence level of .95 and a confidence interval of .05, with a medium effect size of .03.

Participant Demographics

In additional to the criteria for the target population, I provided Cint with demographic quotas to ensure that the resulting sample aligned to the U.S. Bureau of Labor Statistics (2016) data showing that 25% of IT professionals in the U.S. are women, and 30% are non-whites. The summary provided in Table 1 demonstrates that the actual data collected met each of these targets.

Table 1

Description of Participant Demographics Compared to Quota Targets

Characteristics	n	%
Gender		
Male	300	75
Female	100	25
Race		
White	276	69
Non-white	124	31

The data derived from Cint's quota process was supported by questions in the survey designed to provide additional demographic information. For example, Tables 2 and 3 provide the age and organizational level of the participants completing those questions. Comparing the

two tables reveals that 87.4% (n=394) of the people responding were under the age of 45, while only 77.2% (n=395) self-identified as having formal manager or executive roles in the organization. The implication of these two data points is that the majority of respondents to this survey were early to mid-career IT professionals with some formal leadership role within their respective companies.

Table 2

Demographic Distribution by Age

Characteristics	n	%
21-24	9	2.3
25-34	229	57.3
35-44	111	27.8
45-54	34	8.5
55-64	10	2.5
65+	1	0.3

(n = 394)

Table 3

Demographic Distribution by Organizational Level

Characteristics	n	%
Non-management	23	5.8
Immediate supervisor	68	17.0
Front-line manager	50	12.5
Mid-level manager	79	19.8
Senior manager	93	23.3
Executive	82	20.5

(n = 395)

The survey also included questions to assess respondents' exposure to Agile and DevOps concepts. Of the 287 participants who responded to the question "enter in whole numbers your years of experience working on or leading teams following Agile or DevOps practices," the

average response was 8.5 years, with 92.7% reporting 15 years or less working with these practices. Also, 86.2% (n=400) of the respondents had at least one Agile or DevOps professional certification, with the average participant holding three certifications. The most common certifications were Certified Scrum Master (CSM) at 29.8% (*n=400*) and Certified Scrum Professional (CSP), 31.3% (*n=400*).

Finally, the demographic section included questions designed to provide insight into the companies represented by the respondents. Figure 4 shows that the majority of participants worked for companies employing less than 5,000 people, with the 1,000 to 4,999-person organization representing 38.9% of the responses (*n=396*). The most frequently represented industries were professional services at 19.5%, business services with 17.5%, and manufacturing contributing 11% (*n=393*).
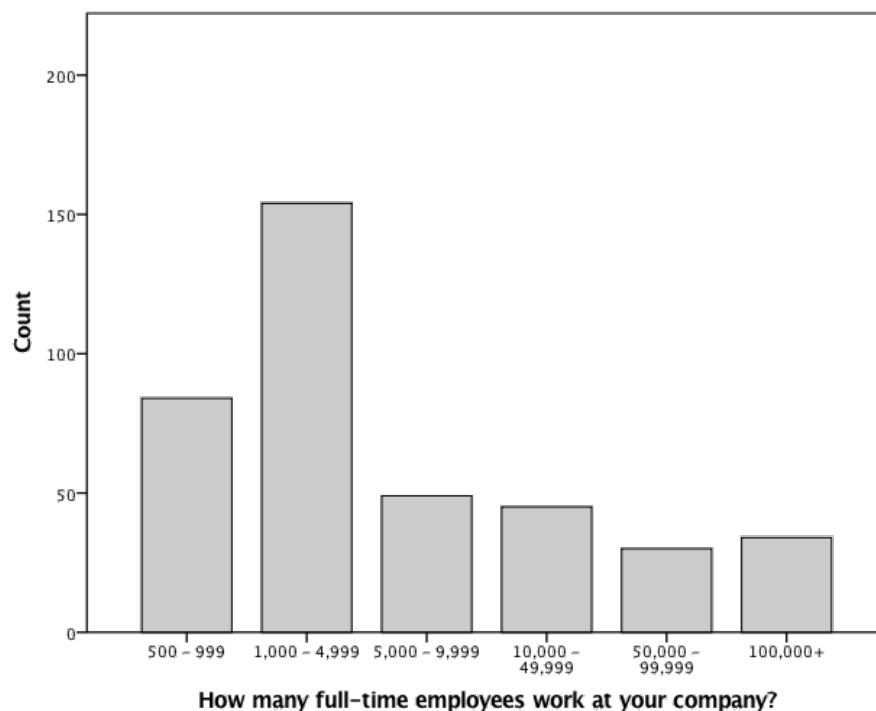

Figure 4. Distribution of survey respondents by company size.

Descriptive Analysis

Before conducting an analysis of the scale data, I performed several operations to assess the quality of the data. The first review focused on missing data and the implications for the validity of the subsequent analysis. Scholars differ on the implications of missing data, with some arguing for imputation of missing information while others resist these techniques in favor of simpler listwise deletion (LD) options on the grounds of introducing artificial bias (Garson, 2015). For this analysis, I first assessed the amount of missing data in the survey responses. Only 8.75% of the cases contained with any missing scale data, and over 99.5% of all individual data points in the overall data set were completed. The next step was to determine if the missing data followed any pattern. The Missing Value Analysis (MVA) feature in IBM SPSS version 24 indicated that the omitted data for the OCB and the OCQ scales were missing completely at random (MCAR), while the MLQ data was missing at random (MAR). Several techniques are available for imputing missing data that meet the MCAR or MAR test, including simple means, single imputation, and multiple imputation procedures (Garson, 2015). For this analysis I selected the expectation maximization (EM) feature of SPSS to impute the missing data.

Reliability of the Scales

The next step to analyze the collected data was to assess it for reliability. Creswell (2009) described reliability as the degree to which scores from a scale are internally consistent and produce the same results after multiple iterations. I measured the reliability of each of the three scales used in the data collection for this study using Cronbach's alpha coefficient. Table 4 provides a summary of the reliability scores obtained for each of the scales as well as the number of items per scale. The table also provides the Cronbach's alpha score documented by the authors of each scale as part of the reliability assessments of their respective instruments. The results

62

indicate that the reliability of the data collected using each of the three selected instruments for this present research fell well within the expected ranges based on each scale's published alpha coefficients.

Table 4

Reliability of the Scales

Scale	# Items in Scale	Chronbach's Alpha	Original Scale α Ranges
MLQ-Form 5X	20	.94	.74 - .94
OCB	24	.82	.70 - .92
OCQ-Readiness	13	.71	.69 - .86

Principle Components Analysis (PCA)

The purpose for principle components (PCA) analysis in the initial stages of reviewing research data according to Garson (2015) is to investigate the relationships among variables. PCA identifies the variables that provided the greatest contribution to variability in correlational statistics. Based on the correlational research design for this present study, a PCA provided useful insights for subsequent steps in the review of the data. Note that while PCA is slightly different than an exploratory factor analysis, the term "factor analysis" is sometimes used interchangeably in practice (Laerd Statistics, 2015), and this procedure uses the factor analysis option in SPSS.

I performed independent PCAs on each of the three scales in this study using the factor analysis function provided by IBM SPSS version 24. The first step in the analysis was to determine the suitability of the data for PCA by visually reviewing the correlation matrix of each scale to confirm that each variable included at least one correlation coefficient > 0.3. I also evaluated the Kaiser-Meyer-Olkin (KMO) score using Kaiser's (1974) classification matrix, and

significance level ($p < .0005$) using Bartlett's Test of Sphericity to confirm that the data was appropriate for factor analysis.

For the 20 questions from the MLQ-Form 5X transformational leadership scale, the SPSS factor analysis output confirmed factorability based on a review of the correlation matrix confirming that all variables had at least one correlation with another variable where $r \geq 0.3$. The KMO measure of sampling adequacy was .97, Kaiser's (1974) highest classification level of "marvelous." Bartlett's Test of Sphericity was .000 ($p < .0005$), indicating that the data was appropriate for PCA. The PCA revealed only one component that had an eigenvalue greater than one that explained 48.72% of the overall variance. This outcome was confirmed by the scree test (Catell, 1966). Since the PCA revealed a single component solution, the Varimax orthogonal rotation was unnecessary. The component loadings and communalities of this solution are shown in Table 5.

Table 5

Component Matrix for PCA for a Single Component Questionnaire

Items	Component Coefficients	
	Component 1	Communalities
MLQ14	.768	.590
MLQ26	.759	.576
MLQ15	.753	.567
MLQ30	.751	.564
MLQ32	.740	.548
MLQ36	.738	.544
MLQ31	.737	.543
MLQ13	.723	.523
MLQ21	.714	.509
MLQ23	.713	.508
MLQ09	.703	.494

Items	Component Coefficients	
	Component 1	Communalities
MLQ18	.702	.493
MLQ34	.702	.493
MLQ10	.701	.492
MLQ25	.672	.451
MLQ08	.655	.429
MLQ02	.619	.384
MLQ29	.616	.379
MLQ19	.591	.350
MLQ06	.553	.305

The PCA for OCB also confirmed the factorability of these variables (correlation with at least one variable at $r \geq 0.3$, KMO measure .919, and Bartlett's Test of Sphericity significant at .000). Unlike the MLQ variables, the OCB data revealed four components with eigenvalues above 1.0 explaining 32.8%, 14.32%, 4.72%, and 4.5% respectively. Cumulatively these four components explain 56.35% of the total variance. The OCB scale did not include subgroups of variables in the 24 questions, so no alignment of component loads to groupings could be determined. The loadings of all four components and their communalities are presented in the rotated solution in Table 6.

Table 6

Rotated Structure Matrix for PCA with Varimax Rotation of a Four Component Questionnaire

Items	Rotated Component Coefficients				
	Component1	Component 2	Component 3	Component 4	Communalities
OCB01	**.723**	.138	-.223	.204	.633
OCB13	**.713**	.156	-.130	.181	.582
OCB15	**.605**	**.366**	.059	.154	.528
OCB10	**.576**	**.461**	.056	-.046	.550
OCB03	**.573**	**.315**	.010	.154	.451
OCB23	**.484**	**.480**	-.078	.207	.514
OCB17	.191	**.665**	-.036	**.313**	.578

Items	Rotated Component Coefficients				
	Component1	Component 2	Component 3	Component 4	Communalities
OCB06	.051	**.646**	-.037	**.375**	.562
OCB09	.211	**.612**	-.124	.156	.459
OCB11	**.302**	**.598**	-.274	.105	.535
OCB08	**.370**	**.551**	-.055	-.051	.446
OCB18	.207	**.551**	-.093	**.383**	.502
OCB12	**.474**	**.546**	-.074	.164	.556
OCB24	**.488**	**.506**	-.054	.134	.514
OCB04Rev	-.018	.047	**.868**	-.075	.762
OCB02Rev	-.083	.022	**.856**	-.104	.751
OCB19Rev	-.062	-.146	**.819**	-.015	.696
OCB07Rev	-.045	-.163	**.804**	.052	.578
OCB16Rev	-.006	-.133	**.782**	-.072	.635
OCB21	.144	.169	-.226	**.720**	.619
OCB05	.094	**.311**	-.041	**.584**	.449
OCB20	**.505**	.086	-.124	**.510**	.537
OCB14	**.461**	.143	.174	**.496**	.509
OCB22	**.403**	.280	.096	**.481**	.481

Note. Major loadings for each item are bolded.

The final PCA assessed the readiness for change elements of the OCQ-C, P, R questions included in the survey for this present study. Readiness for change was further grouped into emotional readiness, cognitive readiness, and intentional readiness. The review for factorability revealed one variable in the correlation matrix that did not have at least one correlation coefficient of 0.3 or greater. This variable (OCQ29Rev) was also a reverse scored item. The KMO measure was .868, which equates to good or "meritorious" according to Kaiser's (1974) classification system. Bartlett's Test of Sphericity confirmed significance at .000 ($p < .0005$). I made the determination to proceed with the PCA.

In the PCA for OCQ-R variables, the first two components had significantly higher eigenvalues (4.13 and 2.93 respectively) that the remaining components, and explained 54.34% of the variance. A review of the Varimax orthogonal rotation revealed no patterns of alignment

between the two components and the subgrouped items of emotional, cognitive, and intentional

readiness. It is notable however that all reverse coded questions were represented in component

2, with the remainder of the questions in the first component. Table 7 summarizes the component

loadings and communalities of the rotated solution.

Table 7

Rotated Structure Matrix for PCA with Varimax Rotation of a Two Component Questionnaire

Items	Rotated Component Coefficients		
	Component 1	Component 2	Communalities
OCQ27	**.742**	-.037	.551
OCQ38	**.729**	-.013	.532
OCQ46	**.720**	.056	.522
OCQ51	**.691**	-.126	.494
OCQ21	**.676**	-.004	.457
OCQ04	**.665**	-.070	.447
OCQ37	**.638**	-.166	.435
OCQ13	**.583**	-.092	.348
OCQ29Rev	.013	**.828**	.685
OCQ36Rev	-.044	**.814**	.665
OCQ49Rev	-.111	**.813**	.672
OCQ43Rev	-.120	**.790**	.639
OCQ40Rev	-.065	**.782**	.616

Note. Major loadings for each item are bolded.

Normality

The correlation and regression analysis techniques used to test the hypotheses of this

present study assumed that the data being analyzed was normal, following a symmetrical bell

curve with most of the responses in the center. The final step of preliminary analysis for this

study assessed the data collected for normality. The statistical techniques used to determine

normality of the data were histograms, normal Q-Q plots, a comparison of the mean to the 5%

trimmed mean, and the Kolmogorov-Smirnov statistic. These calculations were performed using

the composite variables in each case for MLQ transformational leadership (MLQ-TL), OCB, and OCQ readiness for change (OCQ-R).

Figure 5 provides the histogram and normal Q-Q plot for the MLQ transformational leadership composite variable.
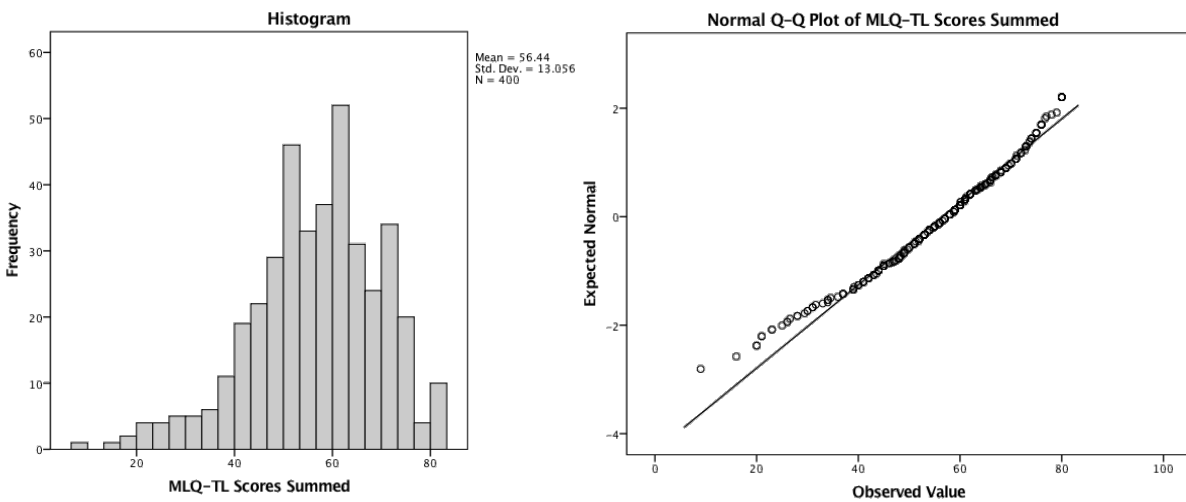

Figure 5. Histogram and normal Q-Q plot for MLQ-TL composite variable showing negative skewness.

The graphs in Figure 5 show that the MLQ-TL variable is slightly negatively skewed. The mean was 56.44, and the 5% trimmed mean was 56.99, so the normality was not overly influenced by extreme values. The Kolmogorov-Smirnov statistic showed a significance of .021 ($p > 0.05$), indicating a violation of normality (Garson, 2015). Based on these results, I applied the reflect and square root transformation procedure to determine if a more normal distribution pattern could be achieved. The results are shown in Figure 6. In addition to a visual inspection of the graphs in Figure 6, the *z*-score (± 2.58 *p*=.01) for the transformed MLQ-TL variable indicated normal distribution with a skewness of .155 (standard error = .122) and kurtosis of -.168 (standard error = .243).
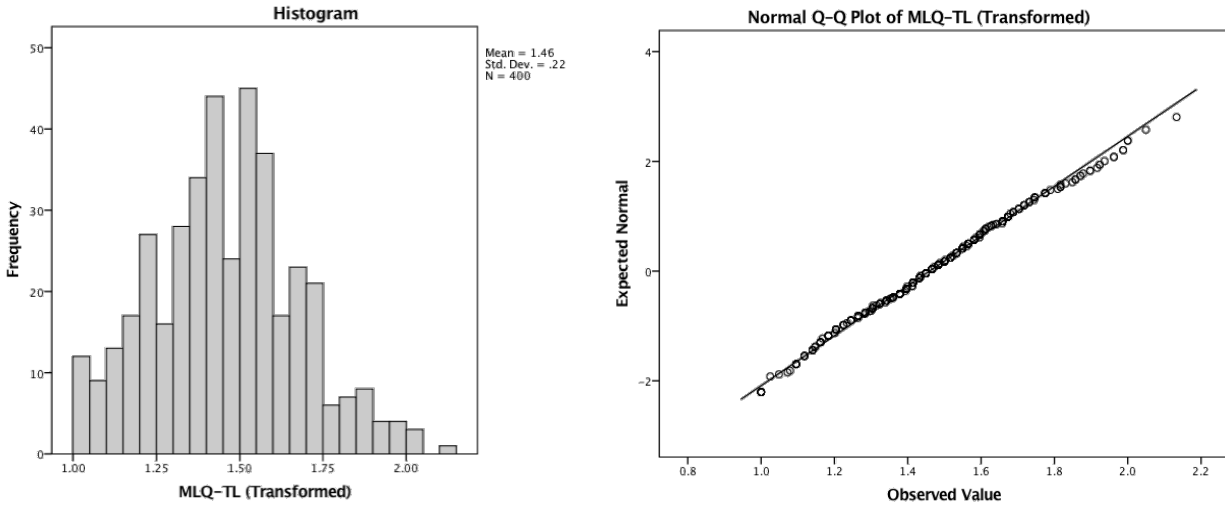
Figure 6. Histogram and normal Q-Q plot for MLQ-TL transformed variable using reflect and square root calculations.

The histogram following the transformation procedure indicated a slightly positive skew, but the normal Q-Q plot showed a strong normalized pattern. Additionally, the Kolmogorov-Smirnov statistic on the transformed composite variable was 0.20, a non-significant result ($p >$ 0.05), indicating normalized data. The conclusion from this analysis was that the MLQ-TL variable followed normal distribution patterns, especially with transformation.

The same tests for normality were next applied to the OCB composite variable. The mean and 5% trimmed mean for this variable were identical at 5.25. The Kolmogorov-Smirnov statistic was just under the p > 0.05 threshold at 0.35, however that is frequently the case for large sample sizes (Garson, 2015). The histogram and normal Q-Q plot provided in Figure 7 indicated the data for this variable follow a normalized pattern. Unlike the MLQ-TL variable, the OCB composite variable did not require transformation to be evaluated for parametric testing.
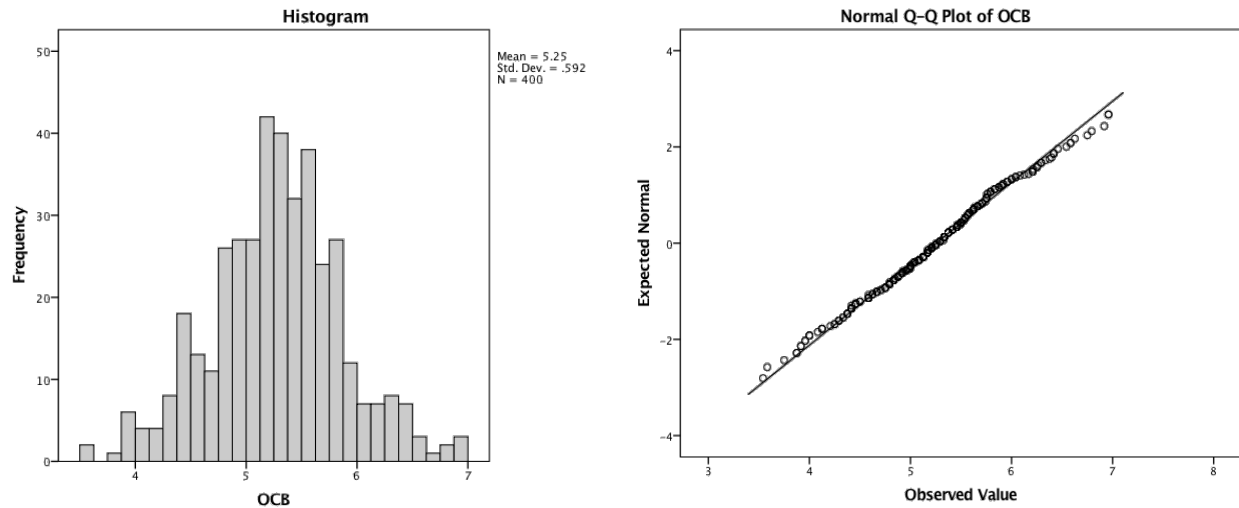
69

Figure 7. Histogram and normal Q-Q plot for the OCB composite variable indicating normal distribution.

The final test for normality focused on the OCQ-R composite variable. The results of this histogram and Q-Q plot analysis produced results that differed significantly from the first two variables. Figure 8 shows that the data was positively skewed and had a high level of kurtosis (1.187). A box plot diagram also revealed a high number of outliers. Although the mean (3.48) and the 5% trimmed mean (3.45) were nearly identical, the Komogorov-Smirnov statistic was .000. The recommended transformation for this type of pattern according to Tabachnick and Fidell (2013, p. 87) is a logarithmic calculation referred to as LOG10.
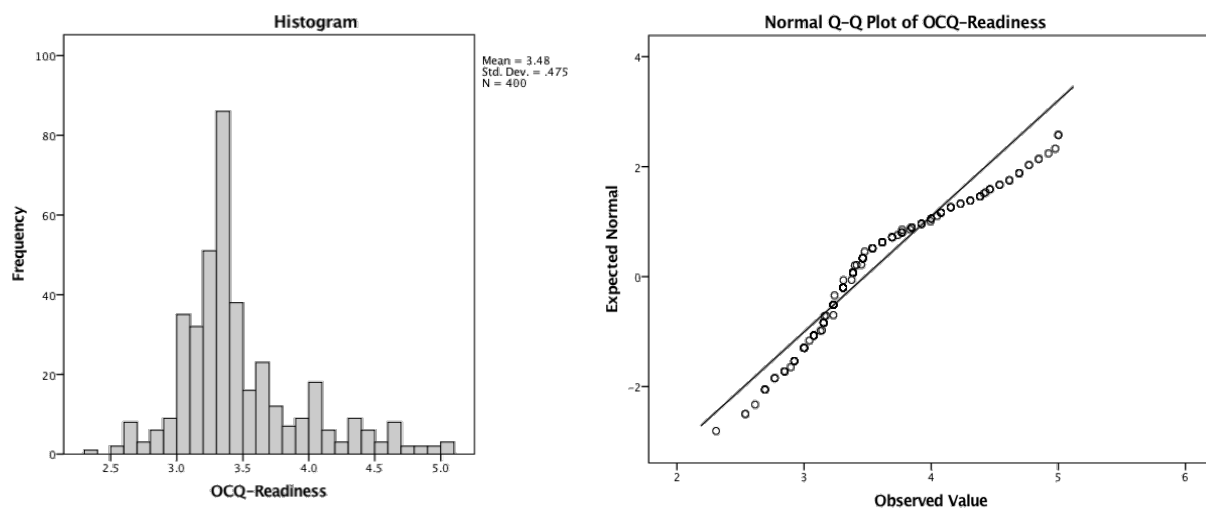

Figure 8. Histogram and normal Q-Q plot for the OCQ-R composite variable indicating positive skewness and high kurtosis.

70

The result of the LOG10 operation on the OCQ-R composite variable can be seen in Figure 9. The skewness follows a more normal bell-shaped curve, and the kurtosis while still present is less severe. The transformation did not improve the Kolmogorov-Smirnov statistic, and the *z*-score for skewness fell significantly outside the ±2.58 range for normal distribution at 5.6 (p = .01). However, based on the histogram, normal Q-Q plot, and the 5% trimmed mean comparison, I determined that the normality of the OCQ-R transformed variable was likely to be sufficient for parametric testing.
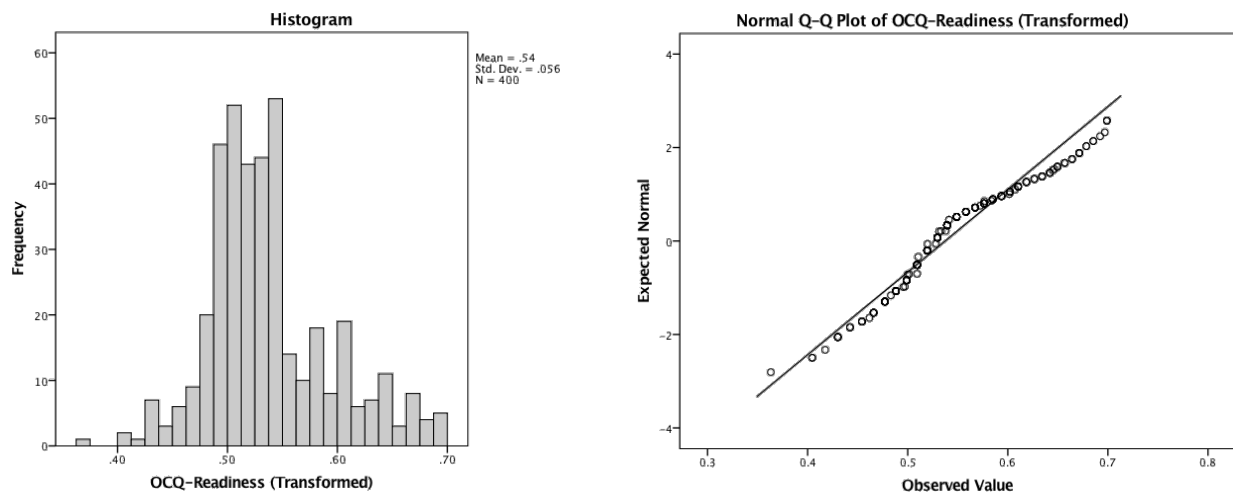

Figure 9. Histogram and normal Q-Q plot for OCQ-R transformed variable using LOG10 calculations.

Analysis of Hypotheses

Pearson's Correlation

A Pearson's correlation was conducted to examine the relationship between TL demonstrated by each respondent's front-line managers, and a self-assessment of their OCB and their OCQ-R during an Agile or DevOps initiative. An initial analysis indicated the relationship between TL and each of the dependent variables OCB and OCQ-R was normally distributed as assessed by scatterplot review and by Shapiro-Wilk's test (*p* > .05), with no outliers. Using Cohen's (1988) scale for assessing coefficient values, there was a moderate positive correlation

between the TL of participants' front-line manager and their own OCB, $r(98) = .472$, $p < .0005$. The coefficient of determination was $r^2 = .222$, indicating that TL statistically explained 22% of the variability in OCB. There was also a moderate positive correlation between transformational leadership of participant's front-line manager and their own readiness for change, $r(98) = .357$, $p < .0005$. The coefficient of determination was $r^2 = .127$, indicating that TL statistically explained 13% of the variability in OCQ-R. Given the statistically significant relationship between TL and both OCB and OCQ-R, the null hypothesis for H1 and H2 can be rejected, and each alternative hypothesis accepted as follows, with a summary of the correlations shown in Table 8.

- $H1_a$: Higher levels of TL behaviors exhibited by front-line managers are related to higher levels of employee readiness for change during Agile and DevOps initiatives.

- $H2_a$: Higher levels of TL behaviors exhibited by front-line managers are related to higher levels of employee OCB during Agile and DevOps initiatives.

Table 8

Pearson Correlations for Study Variables

	MLQ-TL
OCB	.472*
OCQ-R	.357*

Note. * = statistically significant at $p < .05$ level

Linear Regression

A linear regression was conducted to examine whether or not the value of each dependent variable (OCB, OCQ-R) could be determined based on the value of the independent variable MLQ-TL. Specifically, this regression analysis assessed the degree to which each respondent's organizational citizenship behaviors and readiness for change could be explained by their front-

line manager's transformational leadership behaviors. The analysis also evaluated the statistical significance of the regression between TL and each of the two dependent variables.

Linear regression requires several assumptions to be met in order for the resulting data to be meaningful (Laerd Statistics, 2015). The first two assumptions require one dependent and one independent continuous variables. The next assumption is that a linear relationship exists between the independent and dependent variables. Visual inspection of the scatterplots in Figure 10 indicated that a linear relationship exists in the survey data for this present study between TL and OCB, and between TL and OCQ-R.
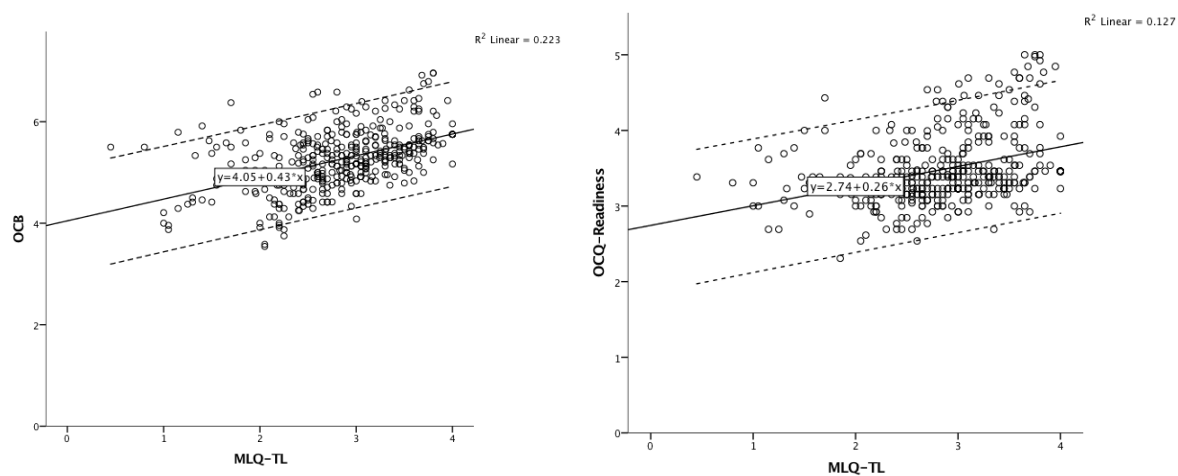

Figure 10. The scatterplots for MLQ-TL and each of the two dependent variables OCB (left) and OCQ-R (right) indicate a linear relationship exists between the independent variable and each dependent variable.

The next assumption related to linear regression is independence of observations. For MLQ-TL and OCB there was independence of residuals based on a Durbin-Watson statistic of 1.977. The same was true for MLQ-TL and OCQ-R, with a Durbin-Watson statistic of 2.02. Another assumption is that there are no outliers where the observed value for the dependent variable differs significantly from the anticipated pattern. SPSS detected no outliers in the analysis between MLQ-TL and OCQ-R. However, a single case presented an outlier in the

casewise diagnostics between MLQ-TL and OCB. Options for addressing outliers include transforming the variable, deleting the outlier from the analysis, or leaving the outlier in the regression. In this instance, the outlier was left in given that the reported standard residual was only 3.065 compared to the 3.0 standard deviations, and that the analysis presented only a single outlier. Additionally, the assumption of homoscedasticity was visually assessed and confirmed using a scatterplot of standardized residuals compared to standardize predicted values.

The final step in the review of the assumptions related to linear regression analysis was to determine if the residuals were normally distributed. As with the assessment of normality for each of the three variables in this study, the normality of residuals was evaluated using histograms and normal Q-Q plots. In the current study, the residuals were normally distributed based on an assessment of the normal probability plots for MLQ-TL and each of the two dependent variables (OCB and OCQ-R).

After reviewing the output of the linear regression analysis provided by SPSS for conformity to each of the required assumptions, I changed focus to interpreting the results of the linear regression statistics. A review of the model summary confirmed the r and r^2 values for both MLQ-TL to OCB ($r = .472$, $r^2 = .223$) and MLQ-TL to OCQ-R ($r = .357$, $r^2 = .127$) presented in the prior correlation analysis. The linear regression added adjusted r^2 values to correct for positive bias. In this analysis, the adjusted r^2 values were .221 and .125 for OCB and OCQ-R respectively.

The next step was to review the ANOVA values to determine if the regression model yielded a better prediction of the dependent variable as compared to the using the mean. Table 9 provides the ANOVA results for OCB and OCQ-R. The analysis confirmed that transformational leadership statistically significantly predicted both organizational citizenship behavior ($F =$

74

113.989, $p < .0005$) and readiness for change ($F = 58.059$, $p = < .0005$) among the survey respondents for this present study.

Table 9

ANOVA summary for MLQ-TL as a predictor for OCB and OCQ-R

	Sum of Squares	df	Mean Square	F	Sig.
OCB					
Regression	31.092	1	31.092	113.989	.000
Residual	108.559	398	.273		
Total	139.650	399			
OCQ-R					
Regression	11.468	1	11.468	58.059	.000
Residual	78.615	398	.198		
Total	90.083	399			

Note. Significance based on MLQ-TL as the predictor.

The final exploration of the linear regression results was to determine the degree to which transformational leadership behaviors in front-line managers can predict the level of organizational citizenship behavior and readiness for change. A univariate analysis of variance was run testing each of the possible MLQ-TL scores from 0 to 4 and the corresponding OCB and OCQ-R scores that could be predicted as a result. Table 10 provides the summary of this analysis derived from the K matrix for each dependent variable.

Table 10

Contrast results (K matrix) for MLQ-TL with predicted scores for OCB and OCQ-R

	OCB (1 – 7)		OCQ-R (1 – 5)	
	Predicted OCB Score	95% CI Range	Predicted OCB Score	95% CI Range
MLQ-TL Scores				
4-Frequently if not always	5.758	5.652 – 5.864	3.783	3.693 – 3.873
3-Fairly often	5.330	5.277 – 5.383	3.524	3.478 – 3.569
2-Sometimes	4.903	4.820 – 4.985	3.264	3.194 – 3.334

	OCB (1 – 7)		OCQ-R (1 – 5)	
	Predicted OCB Score	95% CI Range	Predicted OCB Score	95% CI Range
1-Once in a while	4.475	4.323 – 4.627	3.004	2.874 – 3.134
0-Not at all	4.047	3.819 – 4.275	2.744	2.550 – 2.939

Note. All confidence intervals were 95%, all contrast estimates were significant at $p < .0005$.

Summary

This present study was conducted to assess the relationship between transformational leadership behaviors (TL) exhibited by front-line managers, and the organizational citizenship behaviors (OCB) and readiness for change (OCQ-R) of subordinate IT professionals in the context of Agile and DevOps implementations. After confirming the reliability and normality of the survey data, Pearson's correlation analysis and linear regression were performed with TL as the independent variable and OCB and OCQ-R as dependent variables. The results of the analysis revealed a statistically significant but moderate relationship between TL and each dependent variable in this sample. This outcome led to rejecting each of the two null hypotheses proposed in this present research, and the alternative hypotheses were accepted.

Additional analysis explored the degree to which TL could predict the level of OCB and OCQ-R in respondents. The predictive range was relatively narrow compared to the full range of possible responses. For example, the TL scale using scores 0 through 4 produced contrast results showing predictability of OCB scores (on a scale of 1 to 7) between 3.819 and 5.864, a range of only 2.045 points. Likewise, the predictability of OCQ-R scores (on a scale of 1 to 5) produced a predictability range of 1.323 points. The conclusion from this examination was that while a general claim can be made that higher levels of TL can predict correspondingly higher levels of OCB and OCQ-R, the level of fidelity in the predictive ranges was insufficient for any deeper insights.

76

CHAPTER 5. CONCLUSIONS

Introduction

The intent of this present study was to examine if a relationship exists between the adoption of transformational leadership behaviors by front-line managers (measured by the MLQ-Form 5X), and two employee characteristics that have been shown in scholarly literature to contribute positively to the success rate of organizational change: employee engagement (measured by OCB), and employee readiness for change (measured by (OCQ-R). The research focused on Agile and DevOps initiatives as the specific type of organizational change, and IT professionals as the employees most likely to influence (positively or negatively) the outcomes of adopting Agile or DevOps.

Chapter 5 begins with a review of the research questions that formed the foundation and direction for this study and a summary of the insights the data analysis provided to answer each question. Recurring themes, patterns, and unexpected findings are also explored in this section. The following segment evaluates the degree to which the research contributed to addressing gaps in the existing body of knowledge and how future scholar-practitioner efforts can benefit from the information provided. Similarly, Chapter 5 also provides an assessment of how the insights in this present research could contribute to solving the business problem of frequent failures in organizational change initiatives. The chapter concludes with a review of opportunities for future research that could extend the knowledge gained through this study, or address the limitations of the research exposed in the findings discussed in Chapter 4.

Evaluation of Research Questions

The research question outcomes in this current study were generally as expected. Given the scholarly research that demonstrated the positive influence of TL in guiding OC (Pawar &

Eastman, 1997; Bass & Riggio, 2006), and similar research that showed TL led to positive

attitudes and increased performance among employees during OC (Bass, Avolio, Jung, &

Berson, 2003; Carter et al., 2013; Nemanich & Keller, 2007), it was reasonable to anticipate that

each of the alternative hypotheses proposed would be accepted. However, the degree of

influence TL had among this sample if IT professionals on their OCB and their OCQ-R (based

on the Pearson's correlation analysis) was only moderate (.472 and .357 respectively, $p < .05$).

There are several possible explanations for this outcome.

The first contributing factor to the moderate correlation between TL and the dependent

variables could be the experience and organizational level distribution among the respondents.

Only 5.8% of the responses came from non-management knowledge workers in the IT

profession. By adding in front-line supervisors, the percentage increased to 28.8%. That means

the remaining 71.2% of the responses came from managers and executives. Since most of the

studies on employee engagement and readiness for change focus on front-line employees, it is

possible that the patterns of OCB and readiness for change are altered as people move to higher

levels of responsibility in the organization. It is also reasonable to conclude that people who have

risen through the organization to higher and higher levels of responsibility would naturally be

more engaged and would be involved in planning and implementing change.

Another possibility is that there are other moderating factors leading to OCB beyond TL

(Judge & Piccolo, 2004; Podsakoff et al., 2000; Wang et al., 2011). For example, Gilmore, Hu,

Wei, Tetrick, and Zaccaro (2012) found that positive affectivity reduced the influence of

transformational leadership on OCB. The context of Agile and DevOps initiatives as the type of

organizational change explored in this present study could also provide a moderating factor.

Researchers are only just beginning to explore the unique attributes of Agile and DevOps as

types of organizational change, so the attributes of this context compared to other types of change have not been fully explored.

A final perspective to consider is that leaders rarely lead using only one style of leadership. Behaviors from TL as well as from transactional and other leadership styles can be employed based on day-to-day circumstances. To illustrate this point, I ran the same Pearson's correlation test on the transactional leadership questions in the MLQ as an independent variable with OCB and OCQ-R as the dependent variables. There was a moderate relationship (.324, $p <$ .0005) between the transactional leadership styles of the front-line managers reflected in this study and respondents' OCB. OCQ-R had a weak correlation with transactional leadership (.215, $p < .0005$). While the correlation between TL and the dependent variables was certainly stronger than the corresponding correlation analysis using transactional leadership, transactional leadership behaviors were also observed by the study participants simultaneously with TL. The use of varying leadership styles by front-line managers may have contributed to a moderate correlation between TL behaviors and employee attributes of OCB and OCQ-R.

Fulfillment of Research Purpose

The purpose of this present research was to investigate the correlation between TL behaviors of front-line managers, and employee OCB and OCQ-R in the context of Agile and DevOps implementations in large, U.S. based companies. The goal was to address a significant gap in the literature of quantitative research exploring these variables during Agile and DevOps transformations. These objectives were met by the outcomes of the data collection and subsequent analysis. The sample size of 400 responses to the study survey was more than sufficient for a large unknown population (all IT professionals in the U.S.) to achieve statistical significance, and the demographic data collected in addition to the scale data provided strong

evidence that the respondents were in fact IT professionals who had a clear understanding of Agile and DevOps. The analysis of the research data led to a clear conclusion to accept both alternative hypotheses. The linear regression confirmed that TL does explain the variability in OCB and OCQ-R to a degree. In the simplest of definitions, this present study fulfilled the purpose of the research design.

However, the results also highlighted weaknesses and limitations that will be detailed further in the recommendations for future research. The area of greatest concern is the predominance of managers and executives in the sample size. The research parameters for a panel study did not sufficiently anticipate that the distribution of non-management knowledge workers in the sample would be in inverse proportion to the distribution found in most companies. In hindsight, this anomaly could have been prevented by establishing a quota similar to the gender and ethnicity quotas that were included in this data set to ensure the ratio of non-management knowledge workers to managers would reflect realistic percentages.

This present study benefits the scholarly community by opening a new area of research that previously had been largely unexplored. Agile and DevOps have so recently emerged into the mainstream of business practices as of the time of this study that the scholar-practitioner community is just beginning to conduct research related to this specific type of organizational change and to the implications leadership behaviors might have on success or failure of these practices. Given the exponential adoption curve emerging year over year (10th Annual State of Agile Report, 2016), substantial opportunity exists for additional studies to further understand how organizations can increase the probability of success in their Agile and DevOps initiatives.

Contribution to Business Problem

The business problem presented in the introduction to this present study focused on the high probability that organizations engaging in transformational change initiatives such as Agile and DevOps adoption would fail to achieve their intended outcomes (Decker et al., 2012). Factors such as resistance to change in the organizational culture and low readiness for change represented the most common barriers to Agile and DevOps implementations (Ghani, Bello, & Bagiwa, 2015; Fiampolis & Groll, 2016). The research questions sought to explore the degree of influence (if any) that leadership behaviors of front-line managers might have on lowering resistance to change and increasing readiness for change, thus improving the chances for success in implementing Agile and DevOps.

The statistical analysis of the relationship between the variables identified in this research clearly identified a correlation between TL behaviors and OCB and OCQ-R. Given the overwhelming evidence in the body of scholarly literature as to the positive benefits that can be realized by leaders' adoption TL, this study serves as an initial attempt to extend peer-reviewed research on TL into the domain of Agile and DevOps implementations. Business leaders can have increased confidence as a result of this study that encouraging TL behaviors particularly among front-line managers can have a positive influence on how IT knowledge workers respond to the changes that always occur as a result of Agile and DevOps initiatives.

There is also a synergy between Agile and DevOps practices and the behaviors of TL. Agile and DevOps promote self-organizing, empowered teams who develop software and systems with a high degree of innovation and autonomy. It is a reasonable expectation that leadership styles such as TL and servant leadership would encourage and support empowered teams as compared to more transactional, command and control leadership approaches.

81

Organizations considering an Agile or DevOps initiative (or organizations experiencing challenges with an ongoing initiative) could benefit from using the survey instruments included in this present study to assess the level of TL being used by managers and the degree of OCB and OCQ-R being exhibited by knowledge workers. Results that reveal a high level of transactional leadership preferences among managers could serve as an indicator that transformational leadership training (supported by ongoing coaching and mentoring) could tangibly increase the chances for success (Avolio & Bass, 1994; Barling et al., 1996; Bass, 1998; Dvir et al., 2002; Parry & Sinha, 2005; Popper et al., 1992). Likewise, an assessment of knowledge workers' OCB and OCQ-R could provide early warning indicators that the workforce responsible for implementing Agile or DevOps may not be ready to embrace and support the change. Greater focus on both leadership preparation and organizational change management best practices prior to launching Agile and DevOps efforts would be a sound investment to prevent problems with the change process before they occur.

Recommendations for Further Research

A survey of the literature at the beginning of this research effort revealed limited peer-reviewed research on the success factors for Agile and DevOps initiatives, and no published scholarly studies on the specific implications of TL, OCB, or OCQ-R in the context of this specific type of organizational change. Many wide-ranging opportunities exist for scholar-practitioners to extend the body of literature into this domain to provide organizations with deeper understanding and better practical guidance that can help Agile and DevOps implementations be more successful, and produce better business results.

One of the most significant limitations to this study was the low percentage of non-management knowledge workers who responded to the panel survey invitation as compared to

82

managers and executives. Researchers such as Battilana and Casciaro (2013), Oreg et al., (2011), Shin et al., (2012) and others have focused their findings on non-management employees and their responses to change that can inhibit the success of an OC initiative. The fact that the overwhelming majority of respondents in this present study were managers and executives creates a significant limitation on the research findings. The opportunity exists for a similar study in the future to use quotas or hierarchical sampling (Kreft, De Leeuw, & Van, 1994) to ensure the data for the analysis is more representative of the distribution of non-management to management responses found in the body of change management literature.

Further research could focus on collecting data from specific organizations as compared to the broad panel of participants used for this present study. The benefit to such an approach would be the opportunity to correlate the responses of teams of non-management knowledge workers regarding the TL behaviors of their front-line managers to the self-assessment TL responses of those specific managers, as demonstrated in the study by Carter et al. (2013). An additional advantage would be the opportunity to perform a mixed methods study within these same companies where insights from the quantitative findings could be enriched through qualitative methods such as interviews and focus groups regarding their responses to the changes prompted by Agile and DevOps initiatives.

Lastly, this present study was built on a very simple examination of the relationship between one independent variable (TL) and two dependent variables (OCB and OCQ-R). The moderate correlations found in the results of this research underscore the likelihood that the factors contributing to the relationship between leader behaviors and employee response to change are far more complex than the three elements included in this study. The opportunity exists to include other types of leader behaviors, additional dependent variables, and to also

83

explore a wide range of moderating influences. These insights could enhance scholar-practitioners' understanding of the elements that have the potential to enhance or inhibit the success of an Agile or DevOps initiative.

Conclusions

My aim was to determine what relationship exists (if any) between the transformational leadership behaviors of front-line managers and non-manager IT professionals' resistance to change and readiness for change in the context of Agile and DevOps initiatives. The population for this study was drawn from self-identified IT professionals in the U.S. working at companies with more than 500 employees whose work tasks had changed as the result of an Agile or DevOps transformation. Quota limitations on responses ensured that the sample data reflected the gender and ethnicity demographics of the total population of U.S. IT professionals. Although the results of the study confirmed the alternative hypothesis that a correlation exists between TL behaviors of front-line managers and employee OCB and OCQ-R, the relationship was only a moderate one. In addition to the need to capture a more representative sample in future studies, these findings indicate that the factors contributing to the success or failure of Agile and DevOps initiatives are far more complex than one specific leadership approach and two types of employee behaviors. Additional research is required to improve the sample definition and the range of possible contributing factors to provide business leaders with more effective and practical guidance to increase the success rate of Agile and DevOps implementations.

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STATEMENT OF ORIGINAL WORK

Academic Honesty Policy

Capella University's Academic Honesty Policy (3.01.01) holds learners accountable for the integrity of work they submit, which includes but is not limited to discussion postings, assignments, comprehensive exams, and the dissertation or capstone project.

Established in the Policy are the expectations for original work, rationale for the policy, definition of terms that pertain to academic honesty and original work, and disciplinary consequences of academic dishonesty. Also, stated in the Policy is the expectation that learners will follow APA rules for citing another person's ideas or works.

The following standards for original work and definition of *plagiarism* are discussed in the Policy:

> Learners are expected to be the sole authors of their work and to acknowledge the authorship of others' work through proper citation and reference. Use of another person's ideas, including another learner's, without proper reference or citation constitutes plagiarism and academic dishonesty and is prohibited conduct. (p. 1)

> Plagiarism is one example of academic dishonesty. Plagiarism is presenting someone else's ideas or work as your own. Plagiarism also includes copying verbatim or rephrasing ideas without properly acknowledging the source by author, date, and publication medium. (p. 2)

Capella University's Research Misconduct Policy (3.03.06) holds learners accountable for research integrity. What constitutes research misconduct is discussed in the Policy:

> Research misconduct includes but is not limited to falsification, fabrication, plagiarism, misappropriation, or other practices that seriously deviate from those that are commonly accepted within the academic community for proposing, conducting, or reviewing research, or in reporting research results. (p. 1)

Learners failing to abide by these policies are subject to consequences, including but not limited to dismissal or revocation of the degree.

Statement of Original Work and Signature

I have read, understood, and abided by Capella University's Academic Honesty Policy (3.01.01) and Research Misconduct Policy (3.03.06), including Policy Statements, Rationale, and Definitions.

I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the APA *Publication Manual*.

Learner name
and date   Stephen W. Mayner, December 22, 2016