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Psychological Capital as a Mediator Between Team Cohesion and Productivity

Robert John Cesaro
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Walden University

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Walden University
2016

Abstract

Psychological Capital as a Mediator Between Team Cohesion and Productivity

by

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MS, Embry Riddle Aeronautical University, 2009

BS, Embry Riddle Aeronautical University, 2006

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Organizational Psychology

Walden University

May 2016

Abstract

Organizations attempting to optimize productivity are seeking new ways to develop psychological capital in teams. This quantitative study determined whether team cohesion, as assessed by the Revised Group Environment Questionnaire (RGEQ), impacts team productivity, as assessed by the Performance Measurement Team (PMT) Manufacturing Resource System (MRS); whether this relationship can be attributed to a team's level of psychological capital, as assessed by the Psychological Capital Questionnaire (PCQ-12); and whether psychological capital mediates the relationship between team cohesion and team productivity. Forty-five PMTs in a large U.S. defense manufacturing organization were surveyed using the PCQ-12 and the RGEQ, and their respective PMT MRS productivity levels were recorded. Barron and Kenny's 4-step mediation analysis was employed using simple and multiple regression to determine whether a team's level of cohesion significantly contributes to its productivity and if its level of psychological capital mediates the relationship between cohesion and productivity. The results indicated that team cohesion does not predict team productivity and that psychological capital is not a mediator of team cohesion and productivity. Although cohesion and psychological capital have a significant positive effect on supervisor performance ratings, the effect is diminished when viewing the objective measure of productivity. The study promotes positive social change in the workplace by elevating awareness of the effect of team cohesion on the psychological states of manufacturing workers. Understanding these relationships will help organizations to implement teaming methods that support the efficiencies and well-being of employees.

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Dedication

This work is dedicated to my wife, Barbara, for her love, patience, and support of my educational pursuits. Thank you for allowing me to commit myself to this work and for understanding when it often took precedence over our time together. I am blessed to share my life with you. To my son, Bobby: You have had the opportunity to see the challenges, hardships, and the accomplishments that hard work, resilience, and tenacity can offer. I pray that this work will be an inspiration to you. I am so very proud of you. To Meagan: It has been a joy to watch you grow into the person that you have become. You are a wonderful daughter, wife, and mom. I love you. To my daughter Erin: You have been an inspiration to me. It has been a blessing to watch your relentless pursuit of higher education in the face of numerous obstacles. I am certain that your diligence will soon be rewarded. Finally, to my beautiful granddaughter, Lizzie: My hope for you is that you carry forth the scholarly knowledge and social contributions that this world desperately needs. You are the future, and I know that your gifts will serve to make this world a better place.

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Chapter 1: Introduction to the Study

As global competitiveness increases, companies and organizations must find new ways to increase efficiency (Kathawala, Zhang, & Shao, 2005). Efficiency is defined as the level of performance of a process that maximizes the output per unit input ratio (Han, Xue, Ge, Wu, & Su, 2014). A key measure of efficiency is organizational productivity (Heshmati, 2003). Labor productivity is the quantity of output per time spent or numbers employed (Cummins & Weiss, 2013). An efficient organization uses the lowest number of labor inputs to create the greatest amount of product or the greatest number of service outputs. Labor efficiencies are among the largest opportunities for efficiency improvements because employees occupy the greatest portion of organizational overhead (Kathawala et al., 2005).

Researchers have explored employee performance using various lenses, such as organizational climate (Luthans, Norman, Avolio, & Avey, 2008); social capital (Burt, 2002); team cohesion (Fruhen & Keith, 2014; Salas, Cooke, & Rosen, 2008); psychological capital (Luthans, Avolio, Walumbwa, & Li, 2005); and trust (Betts & Santoro, 2014). Most researchers have concluded that teaming relates positively to workplace performance. Cuthill, Roach, and Atze (2010) defined teaming as the grouping of members to share expertise and collaboration on projects to achieve mutually beneficial outcomes. Although workplace performance encompasses such outcomes as productivity, absenteeism, behavior, and satisfaction (Grawitch, Trares, & Kohler, 2007), this study narrowed the scope by addressing the effects of team cohesion on team productivity. Although most of the literature has addressed the positive relationship of

team cohesion and individual productivity on team productivity (Evans & Dion, 2012; Rosh, Offermann, & Van Diest, 2012), some researchers have disputed the theory of cohesion, as well as the positive relationship between cohesion and performance (McLeod & Von Treuer, 2013). Very few researchers have considered the psychological states experienced by workers because of their perceptions of cohesion levels within their teams. These psychological states of hope, optimism, self-efficacy, and resilience have been termed collectively as *psychological capital* (Luthans, Norman, et al., 2008).

Psychological capital is a construct that emerged in the early 2000s in response to American Psychological Association (APA) President Seligman's call for more positive-based research (as cited in Fowler, Seligman, & Koocher, 1999). Prior to Seligman's call to understand how individuals can use their inherent strengths to be happier and more fulfilled, the traditional goal of psychology was to identify and heal individual disorders (Carr, 2011). Positive psychologists search for natural intellect and inherent abilities within individuals (Seligman, 1998), and their goal is to help people to realize their strengths in order to increase their levels of happiness and self-satisfaction (Carr, 2011). Positive psychology is concerned primarily with using the psychological theory, research, and intervention techniques to understand the positive, adaptive, creative, and emotionally fulfilling aspects of human behavior (Lopez & Snyder, 2011).

Literature linking the effects of team cohesion to psychological capital has been sparse. According to Luthans, Youssef, and Avolio (2007), making investments in team members' psychological capital is indicative of the creative and proactive approaches required for organizations to increase their competitiveness.

Background

The recession of 2008 had a devastating impact on financial markets and on employment (Soros, 2009). The U.S. workforce still struggles to adjust to the economic uncertainties created by that situation (Sorenson & Garman, 2013). Slow economic growth and spending reductions have increased the levels of unemployment. Estimations have suggested that 70% of U.S. employees are not working to their individual potential (Sorenson & Garman, 2013). Employee engagement is not at optimal levels, and organizations are seeking innovative ways to raise engagement among team members (Sorensen & Garman, 2013). As 70 million U.S. Baby Boomers make their way toward retirement within the next 10 years, U.S. businesses will have to compete heavily for talented resources (Luthans, Youssef, et al., 2007). These resources are essential for organizations to maintain their competitive positions in the world marketplace (Smit, 2010).

The employee-employer relationship now lacks the loyalties that were common in the mid-20th century (Luthans, Youssef, et al., 2007). Companies now offer employment for durations that serve specific needs and offer no guarantee of continued employment after the objectives are fulfilled (Epitropaki, 2013). Most employees understand that there are no promises of long-term employment, so they seek employment with companies that can offer them new marketable skills and knowledge. They seek tools and talents that will help them to sustain their careers either within their current organizations or, if necessary, outside of the companies (Wey Smola & Sutton, 2002). Relationships of this

nature can threaten the ability of organizations to optimize efficiency and productivity (Baker, 2009).

Psychological ownership is the mental state that employees experience toward ownership of organizational objectives (Epitropaki, 2013). Cognitive and emotional engagements are key contributing factors to workforce engagement (Saks, 2006). Organizational teaming contributes to these factors (Greenberg, Sikora, Grunberg, & Moore, 2012).

As a result of the Budget Control Act of 2011, the U.S. federal government enacted spending cuts on January 1, 2013, as fiscal policy (as cited in Heniff, Rybicki, & Mahan, 2011). Budget sequestration referred to \$85.4 billion in automatic spending reductions during Fiscal Year 2013, with similar cuts in the out years (“Fiscal Year 2014 Budget Request,” 2013). Major U.S. Department of Defense (DoD) budget cuts remain a reality, creating an even greater need to reduce costs (Guertin & Womble, 2012). From almost every vantage point, including aviation, maritime, and ground system development, modernization, and sustainment, total acquisition costs have escalated (Watts, 2008). A new strategy is needed to drive down costs, spur innovation, and improve acquisition performance (Walker & Hampson, 2003). The most affordable suppliers will most likely become the most attractive to DoD purchasers (Kearney, 2011). Organizations seeking to remain affordable must employ various tactics, including leaner thinking, overhead cuts, and teaming strategies, to optimize the productivity of the labor force (Gray & Vander Wal, 2012). Increased productivity means that organizations can keep customer costs down (Rummler & Brache, 2012).

Teaming strategies have existed for many years (Hackman & Wageman, 2005). The Tavistock Institute defined high-performance work teams (HPTs) in the 1950s, which became attractive in the 1980s to companies such as Boeing and General Electric (Hanlan, 2004). As a function of HPTs, many businesses achieved success in customer satisfaction, employee ownership, and shareholder support within a year (Hanlan, 2004).

HPTs lost popularity by the mid-1990s and were viewed by organizations as marketing tools rather than performance mechanisms (Hanlan, 2004). In the United Kingdom, organizations with strong communication and team-based decision schemes were defined as high-performance workplaces (Katzenbach, 2000). Organizations in the commercial sector, as well as the U.S. government, have since resurrected the HPT model (Maynard, Mathieu, Gilson, O'Boyle, & Cigularov, 2013). The critical processes and team dynamics required to increase performance will be driven by HPTs (Katzenbach, 2000).

A key factor in teaming is the level of cohesiveness or cohesion among the team members. Although researchers have offered multiple definitions of cohesion (Besieux, Baillien, Vander Elst, & Euwema, 2012; Dyaram & Kamalanabhan, 2005), most researchers have identified cohesion as the task-related commitments and interpersonal attractions of the team members (Carron & Brawley, 2000; Salas et al., 2008). Cohesion occurs when the team members unify and work collectively to achieve a goal and satisfy the emotional needs of the team members (Cha, Park, & Lee, 2014). Cohesion also influences employee engagement within work teams (Harter, Schmidt, Killham, & Agrawal, 2009). Team member engagement aligns with such organizational outcomes as

productivity (Harter et al., 2009). Psychological capital development is a major focus of organizations that seek productivity and competitive advantages because it has the potential to promote employee performance (Luthans et al., 2005).

Problem Statement

Organizations have worked to understand the value proposition of teaming and its connection to work outcomes (Jaskyte & Dressler, 2005; Salas et al., 2008). Innovative thinking and creative methods are required for organizations to survive and create sustainable growth and development (Luthans, Avey, & Patera, 2008). Maynard et al. (2013) identified the ways in which teaming empowerment affects the psychology of team members. In an effort to increase employees' efficiency, companies created teams of employees to increase their engagement and motivation (Rich, Lepine, & Crawford, 2010). Organizations expected that team cohesion would strengthen relationships in the workplace, thereby fostering employees' engagement and motivation (Beal, Cohen, Burke, & McLendon, 2003). Team cohesion is the tendency of a group to work in unity toward a goal or to satisfy the emotional needs of its members (Carron & Brawley, 2000). Studies have shown that team cohesion and performance have a positive relationship (Forsyth, Zyzanski, & Giammanco, 2002; Mullen & Copper, 1994).

Past research has suggested that a relationship exists between team cohesion and workplace performance (Evans & Dion, 2012; Parke & Orasanu, 2012; Salas et al., 2008). Although these relationships exist, no studies linking cohesion to workplace productivity have been identified. The same is true for the relationship between team cohesion and psychological capital. Many researchers (e.g., Luthans et al., 2005; Luthans,

Youssef, et al., 2007; Luthans, Norman, et al., 2008) have identified the relationships between psychological capital and performance, but no previous literature has used productivity as the dependent variable (DV). To maximize resources and operate effectively and efficiently, organizations need a greater understanding of states of mind of employees and how they can be elevated to create an energized and motivated workforce.

Nature of the Study

This quantitative study investigated the mediation effects of team cohesion on team productivity to determine whether these effects can be fully or partially explained by the levels of psychological capital of the team members. Mediation is a hypothesized causal chain in which one variable affects a second, which then affects a third (Kenny & Judd, 2013). Specifically, psychological capital, as assessed by the 12-item Psychological Capital Questionnaire (PCQ-12; see Appendix A), mediates the relationship between team cohesion and team productivity, as assessed by the Revised Group Environment Questionnaire (RGEQ; see Appendix B) and the Performance Measurement Team Manufacturing Resource System (PMT MRS; see Appendix C), respectively. Figure 1 illustrates the mediating relationship between the independent variable (IV), X, and the DV, Y, where X is team cohesion, Y is team productivity, and M is psychological capital.

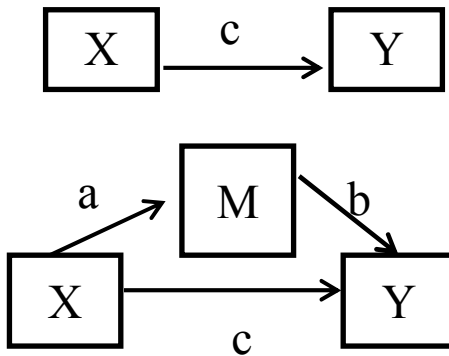


Figure 1. A simple mediation model.

This study focused on 45 PMTs that comprise the hourly manufacturing technicians, engineers, logistics personnel, quality personnel, production supervisors, and production managers in a division of a large U.S. defense manufacturing organization. Team membership ranges from 10 to 50 members and is driven primarily by the magnitude and scope of the respective functions or programs. Typically, PMTs are organized by their task focus, which can be a specific program or function. Some PMTs are organized by explicit tasks within particular programs. All PMTs are monitored by a standard set of company metrics that include labor costs, material costs, various loss, and productivity. The PMTs work collectively on the production floor and then meet weekly in a conference room to review the metrics and discuss the successes and issues experienced throughout the week. Team members are encouraged to offer ideas and suggestions that will improve a product's cost, schedule, and quality.

Forty-five PMTs within a division of a large U.S. defense manufacturing organization were surveyed to obtain information about their levels of team cohesion and psychological capital. Baron and Kenny's (1986) four-step mediation regression analysis was used to test the identified relationships. The steps are explained in Chapter 3.

Mediation is typically the standard for testing theories regarding process, and Baron and Kenny's method has been the preferred method of mediation to date, although researchers have debated the preferred methods of mediation (Rucker, Preacher, Tormala, & Petty, 2011; Zhao, Lynch, & Chen, 2010).

Research Questions and Hypotheses

Two research questions (RQs) and their corresponding hypotheses guided this study:

1. Does team cohesion predict PMT productivity?

H_{01} : Team cohesion, as assessed by the RGEQ, does not predict PMT productivity, as measured by the PMT MRS.

H_{a1} : Team cohesion, as assessed by the RGEQ, does predict PMT productivity, as measured by the PMT MRS.

2. Does psychological capital mediate the relationship between team cohesion and PMT productivity?

H_{02} : Psychological capital, as assessed by the PCQ-12, does not mediate the relationship between team cohesion, as assessed by the RGEQ, and PMT productivity, as assessed by the PMT MRS.

H_{a2} : Psychological capital, as assessed by the PCQ-12, does mediate the relationship between team cohesion, as assessed by the RGEQ, and PMT productivity, as assessed by the PMT MRS.

Purpose of the Study

The purpose of the study was to determine whether employees' psychological capital (i.e., hope, resilience, optimism, and self-efficacy) mediates the effects of team cohesion on team productivity. Understanding the effects of team cohesion on employees' psychological states might help organizations to create new teaming methodologies that support employees' psychological and emotional well-being while fostering increased levels of productivity (Culbertson, Fullagar, & Mills, 2010). Specifically, the study sought to determine whether psychological capital acts as a mediator of PMTs' cohesion associated with team productivity for a large U.S. defense manufacturing organization. Although this study focused on manufacturing employees who work on a full-time basis for one division of a large U.S. defense manufacturing organization, the findings might have broader applications to other business sectors.

Theoretical Framework

The study was based upon Luthans, Norman, et al.'s (2008) research on the effect of psychological capital on organizational outcomes. According to Luthans, Norman, et al.'s psychological capital model, employees' states of hope, optimism, self-efficacy, and resiliency play a significant role in such work outcomes as performance. The researchers used supervisor ratings as a performance measure. The ratings included subjective components such as expected behaviors and other qualitative evaluations. In this study, productivity was based on time and task accomplishment, and it was defined as the time taken by a technician to complete one standard unit of work. This emphasized efficiency and eliminated potential qualitative confounding effects.

Researchers have explored the mediating effect of psychological capital (mediator) on manufacturing performance (DV) by using the predictor variable of supportive organizational climate (SOC; Luthans, Norman, et al., 2008). SOC is the level of perceived support that workers receive from coworkers, functional personnel, and leaders whom they view as helping them to perform their work duties successfully (Luthans, Norman, et al., 2008). In their mediating study, Luthans, Norman, et al. (2008) identified SOC's relationship to team productivity as positive, but not strong. They found that psychological capital has a positive relationship with individual performance.

Luthans, Norman, et al. (2008) also proposed that perceived SOC is related to desired work outcomes of performance, satisfaction, and commitment. Luthans, Norman, et al. determined that psychological capital significantly mediates the relationship between SOC and some of these outcomes. Luthans, Norman, et al. contrasted the mediating effects of psychological capital to Renn and Vandenberg's (1995) critical psychological states (CPS) model. Luthans, Norman, et al. generally supported the mediating role of CPS (experienced meaningfulness, experienced responsibility for outcomes of the work, and understanding of one's work outcome), and they contended that psychological capital might play a mediating role between a positive, supportive organizational climate and employees' performance.

Definitions of Terms

The following definitions served as the operational terms of this study:

Cohesion: The propensity of a team to work in a unified manner toward a specific objective or to satisfy the emotional needs of team members (Carron & Brawley, 2000).

Mediation: The presence of a variable that influences or mediates the effect of an IV on a DV (Barron & Kenney, 1986).

Productivity: The ratio of output to input in production; a measure of the efficiency of production (Heshmati, 2003).

Psychological capital: An individual's positive psychological state of development characterized by having self-efficacy, optimism, hope, and resiliency (Luthans, Norman, et al., 2008).

Psychological contract: The mutual beliefs, perceptions, and informal obligations between employers and employees that set the dynamics for the relationship and define the detailed practicality of the work to be done (Guest, 1998).

Psychological ownership: Developed feelings of possessing things, be they material or immaterial in nature (Pierce, Kostova, & Dirks, 2001).

Social capital: The informal values or norms shared among members of a group that facilitate cooperation among them (Fukuyama, 1997).

Supportive organizational climate (SOC): The overall amount of perceived support that employees receive from immediate peers, other departments, and supervisors whom they view as helping them to perform their work duties successfully (Luthans, Norman, et al., 2008).

Teaming: The grouping of members to share expertise and collaboration on projects to achieve mutually beneficial outcomes (Cuthill et al., 2010).

Assumptions and Limitations

Assumptions

Data were captured using two paper-and-pen survey questionnaires and a productivity measurement and retention system. The survey items were written in English using standard terminology. It was assumed that current situations such as corrective disciplines or positive influences such as rewards and recognitions could influence the employees' responses to both surveys.

Limitations

The data obtained from this study were from the participants' self-assessments of their connections with and to their jobs. These self-assessments were subjective, making the responses reflective of specific feelings or opinions of the organization on the particular date of query. The participating organization required complete anonymity of the survey participants, including name, gender, or age. Although the study offered a comprehensive look at team members' perceptions of cohesion and its effects on psychological capital, descriptive statistics were limited to the number of participants and the team sizes. This study focused on group psychological capital primarily to maintain the anonymity of the participants.

Significance of the Study

This study added to the literature on team cohesion, psychological capital, and team productivity in the workplace by examining whether psychological capital can explain the effects of team cohesion on team productivity statistically. The findings might help organizational leaders to identify teaming methodologies that might support the

psychological states of their employees. Elevated psychological states then might support increased team productivity and improvements in employees' well-being (Culbertson et al., 2010; Luthans et al., 2005). This study might contribute to positive social change by helping organizations to understand more clearly the relationship between team cohesion and psychological capital, and the DV of team productivity of manufacturing employee teams who work for a large U.S. defense manufacturing organization. Teaming arrangements that support workplace productivity and the psychological states of their employees might serve to maximize returns on investment in teaming initiatives. Generalization of the findings to additional target populations might help organizational and team leaders to identify the effects of various teaming arrangements on their employees. This study could help other organizations to understand the impact of team cohesion on work outcomes.

Summary and Transition

Psychological capital has gained the interest of researchers over the past 15 years, as demonstrated by the number of peer-reviewed journal articles and edited volumes, as well as the amount of popular literature. Although the literature on psychological capital has evolved, many questions remain about the relationship of psychological capital to teaming arrangements and organizational outcomes. This chapter included a discussion of the significance of the study and an introduction to the problem. The problem statement described what this study addressed, namely, that organizations must find new ways to optimize productivity to remain competitive.

Past research has shown that psychological capital has a positive effect on performance outcomes. Organizations might improve employees' productivity if they can find methods to increase employees' levels of psychological capital. Creating and influencing teams within the workplace might increase the levels of cohesion among team members that might influence psychological capital and increase productivity levels, thus allowing organizations to perform more work with fewer resources. This strategy has the potential to strengthen the competitive cost advantage in the marketplace. This study was conducted to provide insight into the problem and find ways to resolve it. The researcher specifically explored the relationship between team cohesion and psychological capital, and the DV of team productivity of employee teams who work for a large U.S. defense manufacturing organization in response to this consideration.

Chapter 2 includes the literature review, an explanation of the organization of the chapter, the search strategy to find relevant literature, and an extensive review of the literature. Included in Chapter 3 is an explanation of the methodology, a description of the target population from which the sample was drawn, the instruments used, and the data collection process employed. Chapter 4 presents the results of the study. Chapter 5 presents the researcher's interpretation of the findings and conclusions.

Chapter 2: Review of the Literature

Introduction

This study explored the relationship between team cohesion and psychological capital, and the DV of team productivity of manufacturing employee teams who work for a division of a large U.S. defense manufacturing organization. This chapter reports on peer-reviewed theories and research on teaming, developmental psychological states, and work outcomes. Specifically, this chapter includes a description of the literature search, a review of literature on the theoretical underpinnings of psychological capital, the impact of social capital on the psychological capital of employees, the impact of team cohesion on team productivity, the mediating effects of psychological capital on team cohesion and team productivity, and a research methodology review and justification.

Literature Search

The literature review was conducted using seminal books, edited books, and computerized journal articles from PsycARTICLES, PsycINFO, Google Scholar, ProQuest, SAGE, and manufacturing periodicals. This literature review included prior scholarly works using the search terms *hope*, *self-efficacy*, *optimism*, *resiliency*, *team cohesion*, *psychological capital*, *social capital*, *social networks*, *workplace productivity*, *social ties*, *human resources*, and *organizational communication*, all of which were accessed through such sources as positive psychological journals, industrial and organizational psychology journals, sociology journals, and business journals.

Positive Psychology

Psychological capital was formally introduced at the APA's 1998 convention by the APA's then-President, Martin Seligman. This flourishing movement has been a catalyst for scholars and practitioners aimed at improving society (Donaldson & Ko, 2010). Seligman and Csikszentmihalyi (2000) stated that positive psychology is the study of positive human functioning that focuses on wellness rather than the psychology field's traditional emphasis on mental illness (Seligman, 2002a). Positive psychology focuses mainly on supporting people in an effort to help them to experience happier and healthier lives that have meaning. Positive psychology enables people to realize their full potential (Snyder, Lopez, & Pedrotti, 2011).

C. Peterson (2006) stated that positive psychology has three pillars. The first pillar refers to individuals who achieve positive subjective experience when they are happy, healthy, emotionally sound, and optimistic. The second pillar refers to positive traits, which include character strengths, talents, creativity, wisdom, values, meaning, purpose, interests, growth, and courage. The third pillar refers to positive institutions, such as families, businesses, schools, communities, and societies.

Positive psychology is a branch of psychology whose foundation lies in humanistic psychology (Schneider, 2011). Positive psychologists aim to nurture the positive traits and talents of individuals. This goal is a departure from traditional psychology, which seeks to cure mental illness (Meredith, Sherbourne, & Gaillot, 2011). Positive psychology researchers focus on the emotionally fulfilling aspects of human behavior, and they use research and intervention techniques to gain knowledge of these

positive and adaptive behavioral aspects (Meredith et al., 2011). They also support a wider view of human functioning by considering human strengths as well as weaknesses. Positive psychology researchers recognize that focusing solely on mental disorders might be limited when seeking to understand an individual's pathology (Seligman, 1998).

Seligman (2002a) stated that creating authentic happiness and abundant gratification requires making use of signature strengths. Positive psychology researchers are interested in states of pleasure or flow, values, strengths, virtues, and talents, and the ways in which institutions can create and promote these states (Seligman, 2002a).

Positive psychology does, however, have its skeptics and critics. Although McNulty and Fincham (2012) recognized many of the merits associated with positive psychology, they also identified other researchers who have challenged these assumptions (e.g., Gibson & Sanbonmatsu, 2004; Isaacowitz & Seligman, 2002; Norem, 2001; Shepperd & McNulty, 2002).

Key areas of interest in positive psychology include emotions, traits, relationships, and institutions (C. Petersen, 2006). Positive emotions are related to contentment with one's past, present happiness, and future hope. Positive individual traits focus on virtues and strengths. Positive institutions have strengths that can improve the lives of a community of people (C. Petersen, 2006). McNulty and Fincham (2012) recommended that positive psychologists consider many of the lower level interactions that affect these higher level positive states. There are two areas of study in positive psychology: positive organizational scholarship (POS) and positive organizational behavior (POB). These terms often have been used interchangeably in the literature

(Donaldson & Ko, 2010). The following sections discuss these two important areas in positive psychology.

Positive Organizational Scholarship

POS is a research field within positive psychology that takes a macrolevel view of organizational attributes, emphasizing the positive characteristics of organizations that enable them to function in challenging times (Cameron, Dutton, & Quinn, 2003). POS calls for research examining positive phenomena in organizations (Cameron et al., 2003). POS focuses on the organizational dynamics that lead to a team's strength, vitality, and capability building, as well as the creation of extraordinary individuals, groups, and organizations (Dutton, Glynn, & Spreitzer, 2006). The foundation of POS lies in the belief that when human excellence is embraced by organizations, it unlocks the team members' latent potential and uncovers the potential in people and systems that might benefit the well-being of individuals and their organizations (Culbertson et al., 2010; Rothbard & Patil, 2012).

POS, which draws from many organizational theories, is an interdisciplinary perspective that uses psychology, organizational theory, sociology, and anthropology (Dutton et al., 2006). POS assumes that factors, such as stress, that bring about problem states are not necessarily the factors that cause an extraordinary or a positive state such as thriving (Dutton et al., 2006) and that the removal of stressful conditions will not necessarily be the catalyst ensuring a thriving workplace environment (Conti, Angelis, Cooper, Faragher, & Gill, 2006). A new theoretical lens in organizational studies is required to understand, promote, and enable extraordinary states that are good, honorable,

or virtuous (Dutton, 2008).

Positive Organizational Behavior

Luthans (2002) defined POB as the applied study of positive human resource strengths and psychological capacities that can be measured, developed, and managed effectively for performance improvement in the contemporary workplace. POB focuses on the measurable positive psychological abilities of employees. POB inclusion requires that its constructs be positive, be supported by deep theory, and have valid measures. Hope, optimism, resiliency, and self-efficacy are considered core POB features (Youssef & Luthans, 2007). Each POB tenet must have the potential to be developed to facilitate potential increases in performance (Luthans, 2002). POB has been linked to organizational outcomes, and it has been correlated with increased job satisfaction, employee happiness, and employee commitment (Youssef & Luthans, 2007).

POB is a microlevel approach that seeks to understand individual states and how they can be developed to optimize performance (Luthans & Youssef, 2004). What differentiates POB from other forms of positive psychology is that POB focuses on psychological resource capacities that are state like, which means that POB is readily open to change and development (Avey, Avolio, Crossley, & Luthans, 2009; Luthans, Youssef, et al., 2007).

Psychological Capital

Luthans and Youssef (2004) defined psychological capital as a positive and developmental state manifested by high hope, self-efficacy, optimism, and resiliency. Hope refers to the commitment to persevere toward goals, including finding new paths to

these goals when necessary. Self-efficacy refers to the ability to exert the energy required to succeed at challenging tasks. Optimism refers to the positive commitment to succeed at all times. Resilience refers to the commitment to bounce back and go beyond expectations to achieve success in times of adversity (Luthans, Avolio, Avey, & Norman, 2007).

Psychological capital has a positive correlation with performance and satisfaction (Luthans, Avolio, et al., 2007; S. J. Peterson, Luthans, Avolio, Walumbwa, & Zhang, 2011). Psychological capital also has been related to employee wellness (Avey, Luthans, Smith, & Palmer, 2010). Psychological capital partially mediates the relationship between SOC and employee performance (Luthans, Norman, et al., 2008). Employees with high levels of psychological capital support effective organizational change (Avey, Wernsing, & Luthans, 2008). Higher levels of psychological capital lower the rates of employee absenteeism (Avey, Patera, & West, 2006). Luthans, Youssef, et al. (2007) stated that psychological capital was founded on widely known theoretical frameworks, such as Bandura's (1986) social cognitive theory (SCT) and self-efficacy theory; Scheier, Carver, and Bridges's (2001) optimism theory; Snyder's (2000) hope theory; and Wagnild and Young's (1993) resilience theory.

Hope

Hope is a lower level construct that contributes to psychological capital (Luthans et al., 2005). Snyder (2000) defined hope as a positive motivational state in which goal-oriented determination and the ability to plan to obtain these goals interact successfully. Hope has been positively correlated with performance (Reichard, Avey, Lopez, &

Dollwet, 2013). Goal-oriented thoughts, pathways to achievement, and agency thought are critical components of hope (Snyder, 2000).

Short- and long-term goals drive human behaviors and must be sufficiently valuable to occupy conscious thought (Snyder, 2000). Goals should be achievable but challenging because easily obtained goals do not offer hope to those who achieve them (Snyder, 2000). Individuals with the highest levels of hope tend to generate multiple pathways to goal achievement (Snyder, 2000). Snyder (2000) stated that the motivational component of hope is prevalent when individuals believe that they can initiate and sustain the pathways to achieve goals.

Snyder (2000) posited that motivation levels can be increased quickly by reminding team members that they have the willpower and the waypower to perform well. Motivational inspiration can lead team members to achieve their true potential (Snyder, 2000). Snyder stated that hope is different from self-efficacy or optimism. Self-efficacy references the belief that individuals can master particular domains, whereas optimism is the belief that everything will be fine. Optimistic people expect that future outcomes will be favorable without any attempt on their part to control the outcomes. Hope, self-efficacy, and optimism are tenets of psychological capital, and all of them contribute to goal achievement (Snyder, 2000). Snyder et al. (2011) stated that many psychosocial benefits are associated with hope, and they considered hope a critical factor in coping and therapeutic change.

Self-Efficacy

SCT addresses the behaviors and thought processes of people who are influenced primarily by the actions that they observe in others (Bandura, 1986). Within Bandura's SCT lies the theory of self-efficacy (as cited in Bandura & Barab, 1973). Bandura (1986) stated that individuals who believe in their ability to perform will most likely view challenging tasks as opportunities to attain mastery rather than problems to avoid. Bandura identified this belief as a high level of self-efficacy, the measure of ability to complete tasks and achieve goals (Ormrod, 2006). These beliefs strongly influence the power of individuals to deal effectively with challenges and the decisions that they are the most likely to make (Luszczynska & Schwarzer, 2005).

Bandura (1997) stated that self-efficacy is the belief that individuals have in their ability to succeed at particular undertakings. Most people can set goals that they aspire to achieve as well as things that they seek to change, but mobilizing these plans is not always easy (Bontis, Hardie, & Serenko, 2008). Bandura (1986) found that self-efficacy plays a major role in how individuals approach goals, tasks, and challenges. Individuals who understand their power to affect situations can address challenges confidently and leverage their decision-making abilities (Bandura, 1999).

Optimism

Optimism is hopefulness and confidence about having successful outcomes, and even though optimistic people might not understand the reasons behind situations, they trust that the situations will work out for the best (Seligman, Rashid, & Parks, 2006). Seligman et al. (2006) stated that optimism is defined by individuals' explanatory styles,

or the ways in which they explain situations and events. Vaughan (2000) asserted that optimism is influenced primarily by environmental factors and secondarily by some biological effects.

The effects of optimism might contribute to enhanced mental and physical health. Research also has shown that tempering optimism with realism or even pessimism might build resilience and help people to achieve their goals (Scheier et al., 2001). The positive psychology movement has identified learned optimism as a talent for cultivating joy. Unlike learned helplessness, learned optimism is achieved by consciously challenging negative self-talk (Seligman et al., 2006).

Optimists are typically higher achievers, and unlike pessimists, they usually maintain good health (Seligman et al., 2006). Seligman et al. (2006) posited that pessimists can learn to be optimists by reprocessing their beliefs about and reactions to adversity. Optimists' have a self-serving bias and typically dismiss negative situations as being unlucky. They remain personally detached from negative situations, a view that allows them to bounce back much faster than pessimists from adversity (Seligman et al., 2006). Optimistic people rationalize that good things happen for permanent reasons. They do not dismiss positive situations as fleeting events (C. Peterson, Park, & Kim, 2012). Optimists having a self-serving mind-set also view negative events as fleeting and temporary. Seligman et al. identified this effect as permanence.

Optimistic people are persistent, and they restrain helplessness, whereas pessimists assume that a single failure means total failure (Seligman et al., 2006). Rotter (1966) suggested that there is a relationship between locus of control and optimism.

Seligman et al. (2002a) stated that optimistic people let good events permeate all areas of their lives, and they do not contain their joy and good fortune to a single aspect of their experience. Snyder's (2000) hope model suggests that optimists' self-serving bias attributes negative situations to causes outside of themselves, much like those individuals in Rotter's model, who experience high levels of internal locus of control. Pessimists attribute negative events to their internal failures, much like those with high levels of external locus (Rotter, 1966). Optimists internalize positive events, a process that supports their confidence (Scheier et al., 2001).

Seligman's (2002b) studies of helplessness brought the concept of learned optimism to light. Learned optimism is the notion that reoccurring negative events are beyond the control of individuals. Seligman (1998) stated that some individuals blame themselves for the negative events that they encounter and others detach themselves from the same negative events. Buchanan and Seligman (1995) found that the ability of students to learn optimism helped to reduce their levels of depression. Schulman (1999) researched learned optimism in business and concluded that optimistic employees, on average, perform 35% above their peers and that pessimists have a higher employment turnover rate.

High levels of optimism have been directly related to positive future expectancies (Wrosch, Miller, Scheier, & Brun de Pontet, 2007). Scheier et al. (2001) identified a positive relationship between optimism and well-being, especially when individuals are experiencing stress or facing other difficulties. Optimism also has been related to increased levels of employee engagement and lower levels of avoidance (Affleck,

Tennen, & Apter, 2001). These findings are consistent with research indicating that optimism is related to better health (C. Peterson et al., 2012). Carver, Scheier, and Segerstrom (2010) stated that optimists typically engage in energetic and task-focused behaviors when working toward goals. These behaviors contribute to productivity, which ultimately contributes to socioeconomic status.

Research has suggested that optimists are more persistent in scholarly efforts (Ruthig, Haynes, Stupinsky, & Perry, 2009). Typically, optimists also have more satisfaction than pessimists in their relationships (Carver et al., 2010). Optimists very often set the standard for fulfillment and achievement in their work and family lives, and, when they are faced with uncertainty, they believe in attaining optimal outcomes (Peale, 1952). Optimists emphasize the positive aspects of situations and events. They believe that future outcomes will be the best that they can possibly be (Furnham, 2005).

Resilience

Resilience is the ability to overcome challenges of any nature while learning from the experiences and gaining maturity (Luthans, 2002). The ability to recover from adversity as stronger individuals has an empowering effect (Luthans, Youssef, et al., 2007; Stoltz, 1997). Resilience is the ability to cope with stressful and adverse situations (Luthans & Youssef, 2004). Stoltz (1997) stated that resilient people often adapt their behaviors positively when confronted with adversity, tragedy, and other significant stressors. Resilience is the capacity of individuals to move toward psychological, social, cultural, and physical resources that serve their well-being (Luthans & Youssef, 2004).

Employees who believe that they are engaged, productive, and challenged, and who have the opportunity to grow, are typically in a higher state of well-being than those who do not perceive their workplace in these same ways (Harter, Schmidt, & Keyes, 2003). The emotional states of joy, pleasure, and energy counter stressful effects. Stress has been identified as the difficulties experienced when coping with perceived threats to mental, physical, emotional, and spiritual well-being (Harter et al., 2003). Harter et al. (2003) also stated that the ability of employees to be resilient in the face of stress allows them to respond in productive and nonintrusive ways in the workplace. Resilience overcomes pressures associated with change and the strain of producing results (Hartfiel, Havenhand, Khalsa, Clarke, & Krayner, 2011).

Margolis and Stoltz (2010) identified psychological resilience as the capacity to respond quickly and constructively to crises. Cotton (2011) concurred with Margolis and Stoltz, stating that resilience is a foundational concept that accepts the world as it is and believes that people must adapt to maintain their well-being. Adaptation reflects the true power of human beings (Cotton, 2011), and the ability to transcend fears such as loss, betrayal, and other scary propositions is a testament to their power of adaptation. When people are afraid, they can feel as if their hands have slipped off the steering wheel of a moving car, and they might feel terrified that they have lost all control (Cotton, 2011). Resilience is about individuals having the confidence to keep their hands on the steering wheel of their own lives (Cotton, 2011).

Group or team cohesion occurs when team members unify to pursue a vision or a task collectively (Beal et al., 2003; Carron & Brawley, 2000). This effect is viewed

through member-to-member relationships as well as member-to-team relationships (Beal et al., 2003; Carron & Brawley, 2000). Although team cohesion is a multifactorial process, it can be broken down into four main components: social relations, task relations, perceived unity, and emotions (Forsyth, 2009). Strongly cohesive organizations will most likely have members who are eager to contribute to the team (De Vries, Van den Hooff, & de Ridder, 2006). These team members typically stay with cohesive organizations for longer periods (Dyaram & Kamalanabhan, 2005).

Researchers have recognized the relationship between group cohesion and group performance (Beal et al., 2003; Van Zelst, 1952). Cohesion has many factors contributing to performance, including group size, interdependence, goal types, management demands, and external threats (Carron & Brawley, 2000). Although a team's cohesion levels fluctuate through time, overall levels of cohesion evolve throughout the life of the team (Dion, 2000).

Team members might have different reasons for joining the team (Carron & Brawley, 2000). For example, the reasons might be of a social nature or perhaps the accomplishment of a specific goal. Team members also might be driven to participate in group actions to fulfill an emotional need (Carron & Brawley, 2000). Carron and Brawley (2000) stated that cohesion can be generalized to most teams, including sports teams, fraternal organizations, and work groups. Team pride occurs when members support the group's ideologies while sharing the notion that all team members have value (Beal et al., 2003).

Group cohesion exists when the members have mutual positive feelings toward one another (Lott & Lott, 1965). The social nature of the group might be sufficient to attract members to the group. Individuals might choose to identify with group philosophies or supported causes (Hogg, 1993). Self-categorization theory supports the idea that once individuals identify the similarities and differences of others, they then decide to associate themselves with the group (Hogg, 1993). This association builds a stronger cognitive or emotional bond to the group. An attraction of this nature might lead individuals to act according to group norms, a process known as the depersonalization of self-perception. Hogg (1993) also believed that group attraction has more of an effect on cohesion than individual members' attractiveness does.

Owen (1985) asserted that cohesion is strengthened by similarities found between and among members of the group or team. Guzzo and Dickson (1996) supported the idea that being dedicated to collective goal achievement by sharing responsibilities strengthens the interdependence of the team members, which is the "glue" of cohesion. Interdependence is the bond that unifies and focuses the team members to realize their collective goals (Guzzo & Dickson, 1996).

Consequences of Group Cohesion

There are positive and negative aspects of group cohesion related to organizational performance (Cota, Dion, & Evans, 1993). Forsyth et al. (2002) stated that group cohesion and group performance maintain a reciprocal relationship, meaning that they contribute to each other. When cohesion is defined as attraction to the group or the organization, it has a stronger correlation with performance (Beal et al., 2003). When

group cohesion is defined as task commitment, it is correlated with performance to a lesser degree (Beal et al., 2003).

Cohesion strength varies with group factors such as size. Smaller groups tend to have stronger cohesion-performance relationships than larger groups do (Mullen & Copper, 1994). Highly interdependent groups have stronger cohesion than groups that operate more independently (Gully, Devine, & Whitney, 1995). Hackman (1992) identified team member satisfaction as a function of cohesiveness. Team members in cohesive groups exhibit higher levels of optimism and typically experience fewer social issues (Beal et al., 2003) than those in noncohesive groups (Bollen & Hoyle, 1990; Hoyle & Crawford, 1994). Zaccaro, Gualtieri, and Minionis (1995) identified urgency as a contributing factor to cohesion. Teams with high cohesion and high urgency perform better than those with low cohesion and high urgency.

Individuals lacking close peer relationships are at higher risk of emotional problems (Bukowski & Cillessen, 1998). Although a cohesive environment might support emotional balance, team dynamics might place an emotional burden on these individuals (French, 1941; Pepitone & Reichling, 1955). Cohesion might even drive team members to conform to social norms (Berkowitz, 1954). Janis (1982) defined groupthink as “a psychological drive for consensus at any cost that suppresses dissent and appraisal of alternatives in cohesive decision making groups” (p. 277). It might have an adverse impact on team creativity and problem solving because of the group members’ frequent interactions with one another (Giordano, 2003; Rempel & Fisher, 1997). Giordano (2003)

also stated that because people value their groups, they might be more willing to give in to conformity pressures to maintain or enhance their relationships.

Productivity

Productivity is a ratio of production output to the cost of input required to create the desired outcome (Jackson & Victor, 2011). Input can be capital, labor, or materials. Productivity is measured as the total output per unit of total input (Craig & Harris, 1973). Productivity is context specific, and its operationalization determines the specific units of valid measurement (Richards, Devinney, Yip, & Johnson, 2008).

Labor productivity is the value of goods and services produced over time and divided by the number of hours of labor used to produce them (van Loggerenberg & Cucchiaro, 1982). In other words, labor productivity measures output produced per unit of labor, usually reported as output per hour worked or output per employed person (Schreyer, 2001). Industries that focus primarily on labor costs have been defined as labor-intensive manufacturing industries that make use of human resources in the production process (Thompson & Rapkin, 1981). Labor-intensive companies typically realize greater earnings than capital-intensive organizations do (Das & Kalita, 2009). As stated by Shahidul and Shazali (2011), decreased operational capacity of unfavorable work environments and inefficient process capability are the main causes of low productivity.

Manufacturing productivity is context specific, but researchers have primarily examined partial productivity, total factor productivity, and labor productivity. Partial productivity relates multiple inputs to net outputs, whereas total factor productivity

expresses the ratio of all outputs produced to all resources used (Hulten, 2001). Labor productivity is determined by a worker's potential to reach the highest level of possible performance (Battisti & Iona, 2009; Pineda, 1990).

Caves (1982) observed that efficiency of transformation of inputs to outputs is largely dependent on the skill of the workforce. As stated by Cobb and Douglas (1928), workforce skill is one of the main inputs of the production process. Degree of skill has been recognized as an effective driving force to enhance manufacturing performance (Shahidul & Shazali, 2011). Other contributing factors to productivity include production scheduling, material movement, and process design (Gunasekaran, McNeil, McGaughey, & Ajasa, 2001). Huang, Dismukes, Mousalam, Razzak, and Robinson (2003) stated that when all factors operate at optimum levels, productivity is at its highest level.

Summary and Transition

This chapter addressed the construct of psychological capital; its origins; and its scales of hope, optimism, resilience, and self-efficacy. It also included a discussion of its positive relationship with workplace performance. The chapter also examined team dynamics and the impact on team members' perceptions of cohesion. A discussion was included on the ways in which team cohesion influences workplace performance. Influencers on productivity, specifically cohesion and psychological capital, also were discussed.

Contemporary research has reported that 70 million individuals will retire from the U.S. workforce over the next 10 years. Organizations will have to compete fiercely for talent in order to maintain a competitive presence. The acquisition and retention of

this talent will rest on the ability of organizations to understand the cognitive and emotional needs of their workforce, These organizations must use this knowledge to create a workplace that supports and fosters team members' positive states of mind and, ultimately, increased levels of productivity. New teaming strategies and methodologies might be effective in fostering such positive states of mind. Team cohesion is a contributing factor toward achieving this goal, and workplace teams have been effective in creating a sense of cohesion among their members. Psychological capital is a measure of team members' states of mind and can be influenced by cohesion. Psychological capital might be a useful tool to measure the effectiveness of teaming strategies.

The configuration of teams and the levels of support that they receive will contribute positively to team members' levels of psychological state. Individuals who maintain higher states of psychological capital will feel better and be more productive. Team productivity levels have the potential to serve as an indicator of the levels of psychological capital and team cohesion. Higher performance levels have been associated with supportive organizational climates that include the overall amount of perceived support that employees receive from their immediate peers, other departments, and supervisors whom they view as helping them to perform their work duties successfully.

Chapter 3 defines the statistical approach to determine the mediating strength of psychological capital on cohesion and productivity. The chapter identifies and examines the instruments used to determine whether a significant relationship exists. The RGEQ was used to measure cohesion, and the PCQ-12 was used to measure the developmental states of the participants. Chapter 3 also addresses the PMT MRS productivity

measurement tool that was used to measure the DV of productivity. An overview of ethical concerns and distribution of consent forms and surveys is included.

Chapter 4 presents the preliminary descriptive analysis, RGEQ scores, PCQ-12 scores, productivity scores, and the regression analysis results used to determine whether psychological capital mediates the cohesion-performance relationship. Chapter 5 provides an overview of the interpretations of the results of the current study, implications for social change, and recommendations for future research.

Chapter 3: Methodology

Introduction

This study focused on team cohesion and psychological capital as predictors of team productivity. The theoretical framework for this study was developed from the context of Luthans, Norman, et al.'s (2008) study of psychological capital as a mediator of supportive organization climate and performance. Past research has suggested that a relationship exists between team cohesion and workplace performance (Evans & Dion, 2012; Parke & Orasanu, 2012; Salas et al., 2008). Although these relationships exist, no studies linking team cohesion to psychological capital were found. To maximize resources and operate effectively and efficiently, organizations need additional knowledge about effective teaming arrangements to have an energized and motivated workforce; therefore, this study investigated the relationship between team cohesion and psychological capital, and the DV of team productivity of employee teams who work for a division of a large U.S. defense manufacturing organization. This chapter provides explanations of the sample, methods, and data analysis.

Research Design and Approach

This study followed a quantitative, nonexperimental design employing survey methodology and multiple regression to address the RQs and test the associated hypotheses. Multiple regression identifies the weighted effects of predictor variables on the outcome variable. The predictor variable, team cohesion, was an interval variable assessed by the RGEQ. The predictor variable, psychological capital, was an interval variable assessed by the PCQ-12. Team productivity was assessed by the PMT MRS. The

research design was appropriate because it established whether a relationship exists between team productivity and the two predictable variables.

Research Questions and Hypotheses

Two RQs and their corresponding hypotheses guided this study:

1. Does team cohesion predict PMT productivity?

H_{01} : Team cohesion, as assessed by the RGEQ, does not predict PMT productivity, as measured by the PMT MRS.

H_{a1} : Team cohesion, as assessed by the RGEQ, does predict PMT productivity, as measured by the PMT MRS.

2. Does psychological capital mediate the relationship between team cohesion and PMT productivity?

H_{02} : Psychological capital, as assessed by the PCQ-12, does not mediate the relationship between team cohesion, as assessed by the RGEQ, and PMT productivity, as assessed by the PMT MRS.

H_{a2} : Psychological capital, as assessed by the PCQ-12, does mediate the relationship between team cohesion, as assessed by the RGEQ, and PMT productivity, as assessed by the PMT MRS.

Population and Sample

A division of a large U.S. defense manufacturing organization with a diverse workforce of more than 2,000 employees, all of whom comprised the target population, was the focus of this study. The organization has a permanent, full-time workforce of male and female employees ages 18 years and older whose seniority with the

organization ranges from 1 to 40 years. Employees work in PMTs that comprise hourly manufacturing technicians, engineers, logistics personnel, quality personnel, production supervisors, and production managers. Team member counts can range from 10 members to more than 50 members; these numbers are driven by the magnitude and scope of specific functions or programs.

A power analysis using G*Power3 software was conducted to determine an appropriate sample size for the study based upon the total number of PMTs. The appropriate sample size was determined to be 42, for an effect size of .25, a desired statistical power level of .80, two predictor variables, and a p value of .05. Forty-five PMTs were surveyed and measured.

Typically, PMTs are organized by their task focus, which can be specific programs or functions. Some PMTs are organized by particular tasks within programs. For example, a PMT might be a group of hourly manufacturing technicians, engineers, logistics personnel, quality personnel, production supervisors, and production managers who are responsible for producing various subassemblies that are ultimately built into a larger system. PMT members are responsible for completing these assemblies within the cost, schedule, and quality parameters set by their management. All teams monitor a standard set of metrics that includes labor costs, material costs, various loss metrics, and productivity metrics. The teams work collectively on the production floor and then meet weekly to review the metrics and discuss the successes and issues that they experienced throughout the week. Team members are encouraged to offer ideas and suggestions to improve the product's cost, schedule, and quality.

Instrumentation

Three instruments were used in this study. The RGEQ measures the level of perceived cohesion of individual team members (Carless & De Paola, 2000). The RGEQ has been statistically validated within the workplace setting. The PCQ-12, which measures team members' levels of psychological capital (Luthans & Youssef, 2004), has been statistically validated within the manufacturing workplace (Luthans, Norman, et al., 2008). The PMT MRS, a proprietary time-keeping system, uses a scanning mechanism to record employees' start and completion times for standard tasks. The system determines productivity by calculating the time from start to completion of a specific task and then dividing this time by the standard task time. The result of this analysis is the productivity percentage. This software tool is used at production facilities throughout the organization in the study.

Revised Group Environment Questionnaire

Carless and De Paola (2000) developed the RGEQ, a 10-item assessment that uses a 6-point Likert type of scale of responses ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). It is a self-administered assessment that takes 5 to 10 minutes to complete. According to Carless and De Paola, high scores on the RGEQ are indicative of employees who feel more connected to their team members. The RGEQ is an adaptation of a sport psychology measure of cohesiveness (Mudrack, 1989). That sample comprised 120 employees who were working in teams in a public sector organization.

The composite score of the 10 RGEQ Likert ordinal items becomes an interval scale that defines an individual's total perception level of team cohesion (Zaccaro, 1991;

Zaccaro & Lowe, 1988). There are three scales within the RGEQ: Task Cohesion, Social Cohesion, and Individual Attraction to the Group. Task cohesion refers to the extent to which the team members are united and committed to achieving the work task. Social cohesion refers to the degree to which team members like socializing with each other. Individual attraction to the group refers the extent to which each team member is attracted to the group.

The 10 items on the RGEQ are correlated and have had stability over time. The stability scores are .30, .36, and .46, respectively, across all three scales (Carless & DePaola, 2000). Carless and DePaola (2000) performed a best-fit analysis for the RGEQ and found that the goodness of fit for the RGEQ was .92. Their root mean square error approximation for the RGEQ equaled .07. To confirm the reliability and validity of the RGEQ, Carless and DePaola used a nonnormal fit index and a relative noncentrality index to substantiate the validity of the model. A confirmatory factor analysis was performed on each factor, and factor correlation showed evidence of discriminant validity (Carless & DePaola, 2000).

Psychological Capital Questionnaire-12

The PCQ-12 is a 12-item measure of psychological capital that has undergone extensive psychometric analysis supported by samples from the service, manufacturing, education, high-tech, military, and cross-cultural sectors. This instrument contains 12 Likert-based ordinal items that produce an interval score. The resulting score represents an individual's level of positive psychological capital (Luthans, Avolio, et al., 2007). Multiple researchers have confirmed the value of psychological capital within the

workplace (Gorgens-Ekermans & Herbert, 2013; Luthans et al., 2005). For example, the PCQ-12 has been found to be a powerful predictor of in-role and creative performance, job satisfaction, and organizational commitment (Gorgens-Ekermans & Herbert, 2013).

The four scales of Hope, Optimism, Self-Efficacy, and Resilience within the PCQ-12 are based upon sound reliability and validity evidence. Each scale has a strong connection to state-like constructs in the workplace. (Luthans, Avolio, et al., 2007). All of the constructs are weighted equally and have been checked for face and content validity using the psychological capital criteria (Gorgens-Ekermans & Herbert, 2013).

Internal consistency for each scale within the PCQ-12 ranged from 0.66 to 0.85. Confirmatory factor analyses for the PCQ-12 validated the factor structure of psychological capital. The root mean square error of approximation was 0.046, and the comparative fit index equaled 0.93 (Luthans, Avolio, et al., 2007). Luthans, Avey, Avolio, and Peterson (2010) replicated the higher order and additional-models evaluation in later studies. Along with studies in the United States to date, research on psychological capital has been conducted and published on samples from India, the United Kingdom, South Africa, Portugal, and China (Cheung, Tang, & Tang, 2011; Gorgens-Ekermans & Herbert, 2013; Laschinger & Grau, 2012; Liu, Chang, Fu, Wang, & Wang, 2012; Tripathi, 2011; Wang, Chang, Fu, & Wang, 2012). These studies have shown that the PCQ-12 demonstrated consistent psychometric properties with those originally identified by Luthans, Avolio, et al. (2007).

Performance Measurement Team Manufacturing Resource System

The PMT MRS is a proprietary manufacturing resource-planning tool that measures productivity by assessing the amount of time spent by a technician to build a defined standard unit of work. Manufacturing standards are based upon engineering analysis of historical actuals. Manufacturing technicians electronically scan the start and completion of their build processes. The PMT MRS measures the actual time taken to complete the process and compares it to an expected standard time to create a productivity percentage. Operators' setup times and data-recording times are part of the overall recorded time. The PMT MRS collects the productivity data and sorts them by each PMT.

The PMT MRS has been in use for more than 30 years in the organization that was the focus of this study. Its accuracy and robustness allow the organization to use its data as the basis to develop proposals and conduct budget analyses. It is the foundational tool to measure individual and team productivity. PMTs use these data to identify best practices and opportunities for improvement.

Procedures and Data Collection

With permission from Walden University's Institutional Review Board (IRB), the executive vice president of the manufacturing division, and the director of human resources, the instruments were distributed to the participants by the PMT coordinators at the weekly PMT meetings. The researcher informed the PMT members that participation was voluntary and that they should not put their names on any survey forms. This method ensured the privacy of the participants and the anonymity of their responses. No

incentives were offered for participation. PMT members who chose not to participate could drop their blank questionnaires into the basket.

It was estimated that the instruments would take approximately 15 minutes to complete. The data from each PMT were delineated by the team's name. The researcher handed out paper copies to each participating PMT member and instructed the participants to place the completed surveys in a centrally located dropbox. Participants were given 1 week to complete their surveys. This protocol was meant to ensure the privacy of the participants and the confidentiality of their responses.

The researcher collected the surveys for tabulation and analysis. Returned responses meeting the participation criteria were entered into the database. The researcher then analyzed the survey data using SPSS v.22. Survey responses that did not meet the criteria were excluded. At the conclusion of the study, the results and findings were summarized. These findings were made available to the senior vice president and select others upon request.

Statistical Analyses

Demographic data collection was limited because of privacy concerns. Stratification of the sample was done at the team level. The normality assumption was tested by looking at a P-P plot to determine whether the data closely followed the P-P plot trend line. The assumption was valid. The assumption of homoscedasticity was examined with a residual plot. This assumption was met because the data were randomly spread on the residual plot. This quantitative, mediation study used regression, which was appropriate for such a study (Baron & Kenny, 1986).

Although researchers have debated the accuracy of Likert scales in parametric analysis such as variance, regression, and correlation studies (Harwell & Gatti, 2001), Likert scales have been used consistently in psychological research since 1932. Norman (2010) stated that parametric statistics are robust enough to work with Likert ordinal/interval data, provided that the instruments have strong internal consistency. Although it is true that the space between ordinal ranks cannot be defined quantitatively, many Likert-based studies have mitigated this risk by using composite Likert items to assess a single scale (Jamieson, 2004). This redundancy assures a more robust representation of the scale.

Likert scale items are created by calculating a composite score (i.e., sum or mean) from four or more Likert-type items; therefore, the composite score for Likert scales should be analyzed at the interval measurement scale (Boone & Boone, 2012). Item response models such as the Rasch model are sometimes used to convert ordinal data to interval data. This method is viable when creating new instruments because it assures internal consistency between and among items. The RGEQ and the PCQ-12 use multiple Likert items to assess each scale within the instruments, and their strong internal consistency substantiates their reliability.

The predictor variables of team cohesion and psychological capital were assessed by the RGEQ and the PCQ-12, respectively. The ordinal nature of individual Likert items restricts the use of statistical tools requiring mean and standard deviation values. Boone and Boone (2012) identified the merits of combining at least four Likert items to create a Likert scale. Likert scale data are interval, which allows the RGEQ scores to be added

and averaged to produce a team cohesion score. The mediating variable of team psychological capital was assessed by the PCQ-12, which produces Likert scale scores. All team members' PCQ-12 scores were added and then averaged to produce each team's psychological capital score. The criterion variable was team productivity, which uses the PMT MRS to assess monthly team productivity.

As mentioned in Chapter 1, mediation is a four-step process:

1. Conduct a simple regression analysis, with team cohesion predicting team productivity to test the direct relationship. This regression attempts to confirm the relationship between the team members' perceptions of their team's cohesion and productivity. A key hypothesis in this study stated that psychological capital serves to explain the team cohesion-productivity relationship, thereby making this regression foundational to the study.
2. Conduct a simple regression analysis, with team cohesion predicting psychological capital to test the significance of team cohesion to psychological capital alone. This regression establishes the relationship between the team members' perceptions of their team's cohesion and the team's potential development states. Although a relationship between psychological capital might exist independent of team cohesion, this study sought to explain the relationship between team cohesion and productivity in terms of psychological capital, thereby making this regression an essential link to the mediating relationship.

3. Conduct a simple regression analysis, with psychological capital predicting team productivity to test the significance of psychological capital to team productivity alone. This regression establishes the relationship between team members' perceptions of their team's cohesion and the team's levels of psychological capital. Although a relationship between psychological capital and productivity might exist independently of team cohesion, this study sought to mediate the relationship between team cohesion and productivity in terms of psychological capital, thereby making this regression an essential link in the mediating relationship.
4. Conduct a multiple regression analysis, with team cohesion and psychological capital predicting team productivity. This regression primarily sought to determine whether psychological capital fully or partially mediates the relationship between team cohesion and productivity. The regression analysis controls for psychological capital while regressing productivity on team cohesion. If team cohesion has no effect on productivity when psychological capital is controlled, then full mediation exists. If team cohesion has some effect on productivity when psychological capital is controlled, then partial mediation exists.

The criteria for full mediation are that Steps 1 to 3 must respectively indicate significance and that in Step 4, the coefficients of determination for team cohesion are weak or not significant when psychological capital is controlled for in the regression. Although no causation can be determined based upon the results of this exploratory

study, the information that was collected can be used to add validity to the RGEQ and PCQ-12 measures.

The study looked at the relationship of the responses between the RGEQ and PCQ-12 and then determined whether geographic location or team size had an effect on the survey outcomes individually. Aggregate survey results and PMT data by location also were not evaluated to identify any impact on the range, mean, and standard deviation.

Protection of the Participants

This study complied with all ethical guidelines established by the APA and Walden University's IRB. Before collecting any data, the researcher obtained permission from Walden University's IRB to conduct this study (IRB approval #10-30-15-0185037). The PMT MRS was used to measure the DV of team productivity. Carless and De Paola's (2000) RGEQ was used to measure the participants' perceptions of team cohesion. The participants were made aware that joining the study was completely voluntary and that they could withdraw at any time without repercussions.

No information provided by the respondents could identify them. All employees who were PMT members of selected teams in the organization were invited to participate. To ensure the confidentiality and security of the data, participants' responses were collected anonymously, and no incentives to be in the study were offered. All of the original research documents were stored in a secure location in the researcher's home.

The consent statement identified the risks and the benefits associated with participating in the study. The participants were informed that the researcher would not

divulge any raw data to anyone. The participants were not coerced in any way to join the study, and the risks associated with participating in the study were minimal. All available ethnicities and genders were surveyed. Only individuals who volunteered freely participated. The participants' supervisors were not informed which employees participated.

The organization requested that the names, genders, or ages of the participants not be collected in order to protect their identities as well as any potential critical intellectual property. Although the surveys collected in this study did not require these identifiers, the RGEQ and the PCQ-12 were printed on one sheet in order to maintain the connection of each participant's RGEQ and PCQ-12 scores, respectively.

Summary and Transition

Chapter 3 described the research design and methodology of the study to achieve its objectives and answer the RQs posed in Chapter 1. The research sought answers with data collected from a productivity measurement instrument and surveys of the participants. The RGEQ, a reliable and valid measure of team cohesion, was used. The PCQ-12, which has been widely used in workplace settings, was used to determine the developmental psychological states of the participants. The PMT MRS productivity measurement tool was used to measure team productivity. The sample comprised 45 teams with 761 team members.

The study examined the effects of psychological capital as a mediator of team cohesion and productivity. It used team cohesion and psychological capital as the predictor variables, with productivity as the criterion variable. Simple and multiple linear

regressions were used to determine psychological capital's impact on the mediating relationship.

This chapter began with an introduction; an explanation of the research purpose; and descriptions of the research design, setting, and sample. Also included was an explanation of the participant selection process. Characterizations of the instruments, including validity and reliability, were discussed. Data collection and analysis measures were addressed, along with a discussion about participant anonymity and data confidentiality.

This study was based upon the limited research available on the relationships among team cohesion, psychological capital, and productivity, and the need to understand these relationships to identify new methods of team building as well as new measures to assess the effectiveness of team-building methods. Strengthening the understanding of these relationships might contribute to positive social change within the workplace.

Chapter 4 presents the preliminary descriptive analysis, the team RGEQ scores, the team PCQ-12 scores, the team performance scores, the individual RGEQ scores, and the individual PCQ-12 scores. It also contains the mediation analysis and regression results for team and individual data. Chapter 5 provides an overview of the study, an interpretation of the results, implications for social change and recommendations for future research

Chapter 4: Results

The purpose of the study was to investigate whether employees' psychological capital (i.e., hope, resilience, optimism, and self-efficacy) mediates the effects of team cohesion on team productivity. Examining how team cohesion influences employees' psychological state can help organizations to develop new teaming methodologies that support the psychological and emotional well-being of employees while fostering increased productivity (Culbertson et al., 2010). Included in the chapter are a brief overview of the sample characteristics, the results of the analysis related to the RQs, and an ancillary analysis.

Sample Demographics

The sample comprised 45 teams, and from those teams, data were collected from 761 participants. The sample comprised male and female defense manufacturing employees, including assembly operators, technicians, engineers, and managers who were 18 years of age and older.

Descriptive Analysis

At the team level, a team PCQ-12 score and a team RGEQ score were calculated. In addition to the PCQ-12 and RGEQ data, performance data also were reported. At the individual level, data related to team cohesion were gathered using the RGEQ, and data related to psychological capital were collected using the PCQ-12.

For team data, performance observations ranged from 26.66 to 146.43, with an average observation of 69.48 ($SD = 24.69$). For the PCQ-12, scores ranged from 4.27 to 5.29, with an average of 4.65 ($SD = 0.21$). For the RGEQ, observations ranged from 2.58

to 4.65, with an average observation of 3.68 ($SD = 0.41$). Means and standard deviations for team performance, PCQ-12, and RGEQ data are presented in Table 1.

Table 1

PMT, PCQ-12, and RGEQ Means and Standard Deviations for Teams

Variable	<i>N</i> (teams)	<i>M</i>	<i>SD</i>
PMT	45	69.48	24.69
PCQ-12	45	4.65	0.21
RGEQ	45	3.68	0.41

For the individual data, PCQ-12 scores ranged from 1.00 to 6.00, with an average observation of 4.63 ($SD = 0.79$). For the RGEQ, scores ranged from 1.00 to 6.00, with an average observation of 3.67 ($SD = 0.84$). Means and standard deviations for individual PCQ-12 and RGQ data are presented in Table 2.

Table 2

PCQ-12 and RGEQ Means and Standard Deviations for Individuals

Variable	<i>N</i> (participants)	<i>M</i>	<i>SD</i>
PCQ-12	761	4.63	0.79
RGEQ	761	3.67	0.84

Regression Analysis

Baron and Kenny's (1986) mediation analysis was used to determine whether psychological capital mediates the relationship between team cohesion and team productivity. In other words, the IV is team cohesion, the DV is team productivity, and the mediator is psychological capital. Four regressions were conducted for this analysis.

Tests of Assumptions

The normality assumption was tested by looking at a P-P plot. Because the data closely followed the P-P plot trend line (see Figure 2), this assumption was valid. The

assumption of homoscedasticity was examined with a residual plot. This assumption was met because the data were randomly spread on the residual plot (see Figure 3).

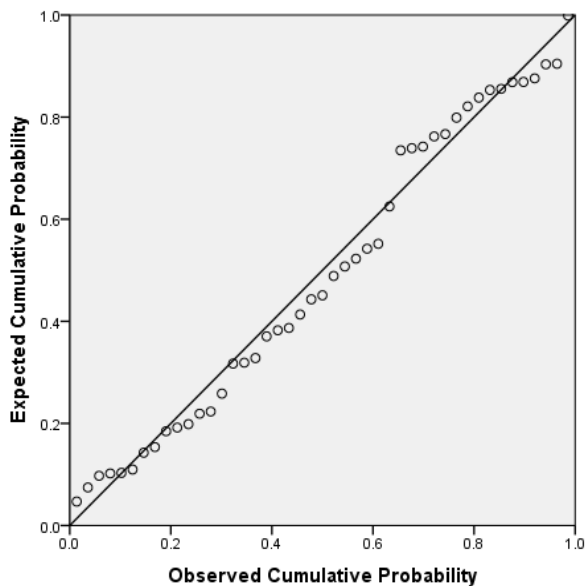


Figure 2. Normal P-P scatterplot for psychological capital and team cohesion predicting team productivity.

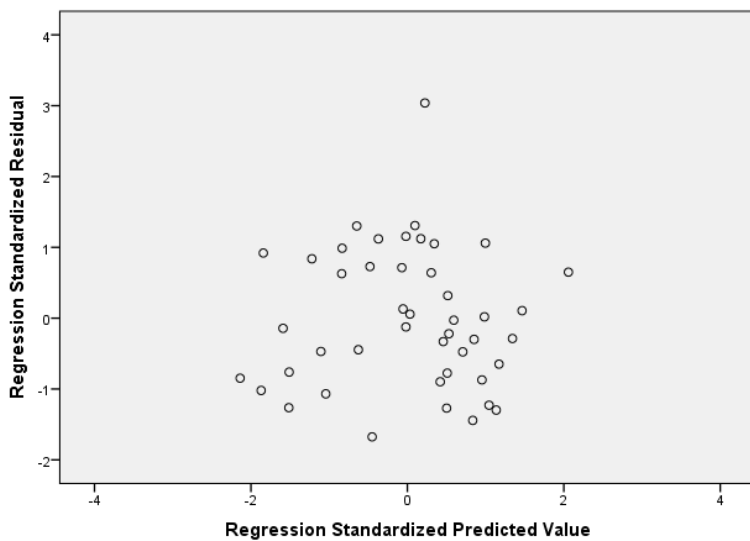


Figure 3. Residual scatterplot for psychological capital and team cohesion predicting team productivity.

The following conditions had to be met so that mediation could be supported:

1. The IV (team cohesion) had to be related to the DV (team productivity).
2. The IV (team cohesion) had to be related to the mediator variable (psychological capital).
3. The mediator variable (psychological capital) had to be related to the DV (team productivity).
4. The mediator variable (psychological capital) had to be related to the DV (team productivity) while in the presence of the IV (team cohesion).

First, the regression was conducted with team cohesion predicting team productivity. The regression was not significant, $F_{(1,43)} = 0.01, p = .943, R^2 < .01$). The first item of Baron and Kenny's (1986) method was not met because the results suggested that team cohesion might not have been related to team productivity. Then, a regression line with team cohesion predicting psychological capital was created. The results of the regression were significant, $F_{(1,43)} = 15.27, p < .001, R^2 = .26$), suggesting that team cohesion was statistically associated with psychological capital. Thus, the second item of Baron and Kenny's (1986) method was met. Using psychological capital to predict team productivity, a regression model was created. This regression model was not significant, $F_{(1,43)} = 0.05, p = .824, R^2 < .01$), so the third item of Baron and Kenny's (1986) method was not met. In other words, team productivity did not have a significant relationship with psychological capital.

Lastly, a multiple linear regression model was created, with team cohesion and psychological capital predicting team productivity. The regression was not significant,

$F_{(2, 172)} = 58.47, p < .001$, suggesting that team cohesion and psychological capital did not properly predict team productivity. Psychological capital was not a significant predictor of team productivity ($B = -6.18, p = .766$) while in the presence of team cohesion. Team cohesion was not a significant predictor of team productivity ($B = 2.31, p = .831$) while in the presence of psychological capital. Because the IV (team cohesion) was not significant in the presence of the mediator (psychological capital), the fourth item of Baron and Kenny's (1986) method was not met. There was no sufficient statistical evidence to suggest that psychological capital is a mediator for the relationship between team cohesion and team productivity. G*Power was used to calculate the achieved power in the analyses. For a regression with a medium effect size ($f^2 = .15$), an alpha of .05, a sample size of 45 teams and 761 participants, and two predictors, the achieved power was .60 (Faul, Erdfelder, Buchner, & Lang, 2014). Table 3 presents the results of the regressions.

Table 3

Regression Results With Psychological Capital Mediating the Relationship Between Team Cohesion and Team Productivity

Dependent	Independent	B	SE	β	t	p
Regression 1:						
Team productivity	Team cohesion	0.66	9.13	< .01	0.07	.943
Regression 2:						
Psychological capital	Team cohesion	0.27	0.07	.51	3.91	<.00
Regression 3:						
Team productivity	Psychological capital	-3.91	17.52	-.03	-0.22	.824
Regression 4:						
Team productivity	Team cohesion	2.31	10.74	.04	0.22	.831
	Psychological capital	-6.18	20.63	-.05	-0.30	.766

Note. Regression 1: $F_{(1,43)} = 0.01, p = .943, R^2 < .01$; Regression 2: $F_{(1,43)} = 15.27, p < .001, R^2 = .26$; Regression 3: $F_{(1,43)} = 0.05, p = .824, R^2 < .01$; Regression 4: $F_{(1,43)} = 51.84, p < .001, R^2 = .38$

Ancillary Analysis

For the ancillary analysis, the researcher used a simple linear regression to assess whether individual cohesion predicts psychological capital. First, the normality assumption for linear regression was tested with a P-P scatterplot (see Figure 4). The assumption was considered to be met because the data closely followed the normality trend line in the P-P scatterplot. By using a scatterplot between the residuals and predicted values, the researcher was able to assess the homoscedasticity assumption. The plot showed random scatter (see Figure 5), fulfilling the homoscedasticity assumption. The assumption of linearity was examined with a scatterplot between team cohesion and psychological capital (see Figure 6). The data did not violate the linearity assumption because this plot showed a positive linear relationship between team cohesion and psychological capital.

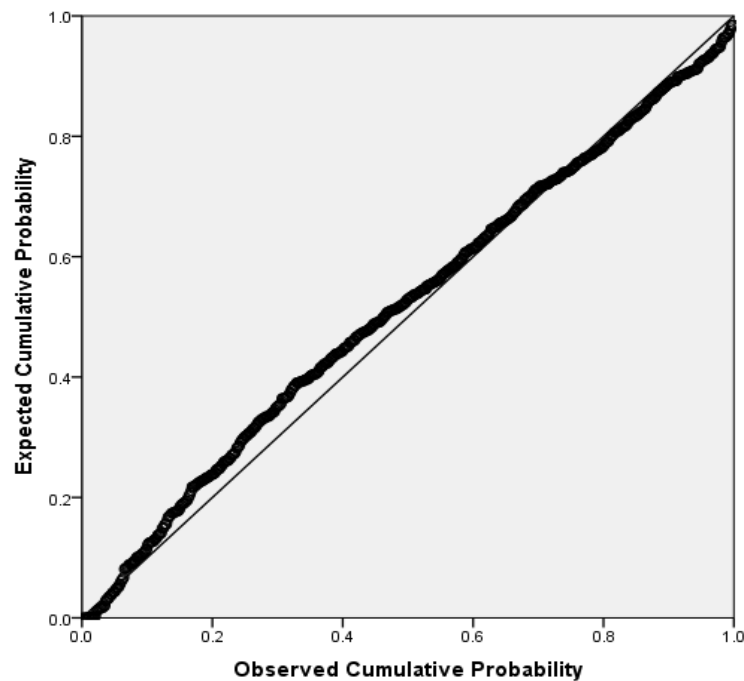


Figure 4. Normality P-P scatterplot of residuals.

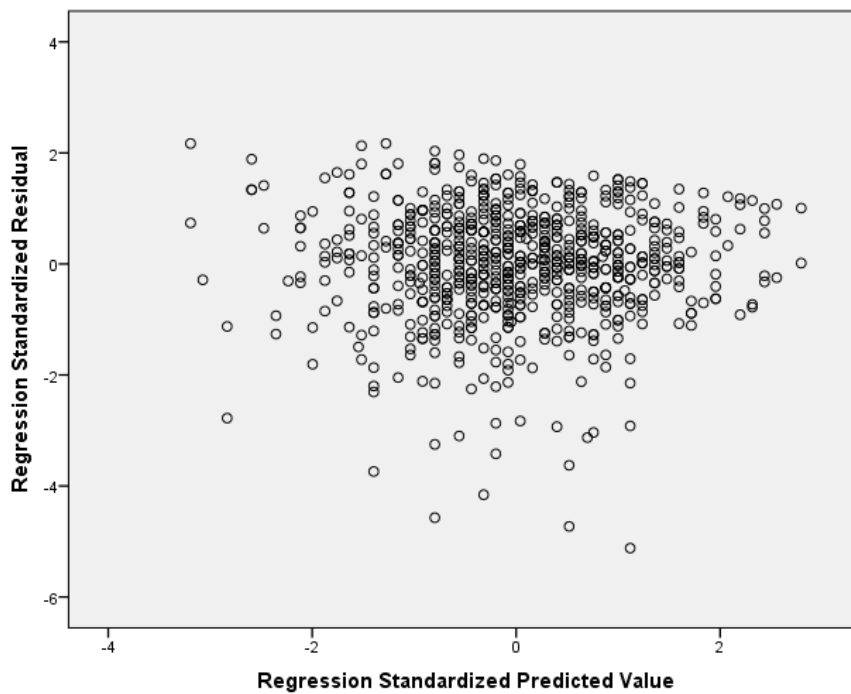


Figure 5. Homoscedasticity plot of residuals and predicted values.

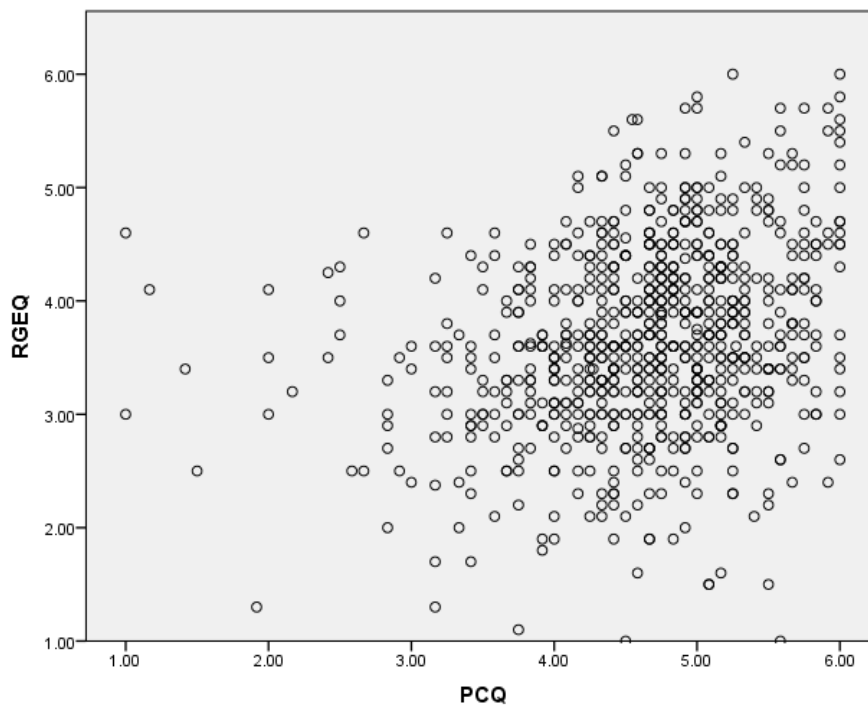


Figure 6. Scatterplot of team cohesion (RGEQ) and psychological capital (PCQ-12).

The simple linear regression model was significant, $F_{(1, 759)} = 62.30, p < .001$, $R^2 = .08$, indicating that 8% of the variation in psychological capital was accounted for by team cohesion. An analysis of the individual predictor indicated that team cohesion ($B = 0.26, p < .001$) was a significant predictor of psychological capital, suggesting that when team cohesion increases by one unit, psychological capital increases by 0.26. G*Power was used to calculate the achieved power in the analyses. For a regression with a medium effect size ($f^2 = .15$), an alpha of .05, a sample size of 761 participants, and one predictor, the achieved power was 1.00 (Faul et al., 2014). Results of the regression are presented in Table 4.

Table 4

Simple Linear Regression With Team Cohesion Predicting Psychological Capital

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Team cohesion	0.26	0.03	.28	7.89	< .001

*Note. Overall model fit: $F_{(1, 759)} = 62.30, p < .001, R^2 = .08$

Summary and Transition

This quantitative study was conducted to investigate whether employees' psychological capital mediates the relationship between team cohesion and team productivity. Data from 45 teams (761 participants) were included in the analyses. The researcher sought to assess whether the influence of team cohesion on individual employees can be harnessed to increase productivity within teams (Culbertson et al., 2010).

The results of the analyses related to RQ1 revealed that the mediating relationship was not supported, using Baron and Kenny's (1986) mediation model. The first

regression conducted with team cohesion predicting team productivity was not significant, $F_{(1,43)} = 0.01, p = .943, R^2 < .01$); therefore, the first item of Baron and Kenny's (1986) method was not fulfilled. The second regression with team cohesion predicting psychological capital was significant, $F_{(1,43)} = 15.27, p < .001, R^2 = .26$); therefore, the second item of the method was met. A third regression with psychological capital predicting team productivity was not significant, $F_{(1,43)} = 0.05, p = .824, R^2 < .01$); therefore, the third item of the method was not met. Finally, the regression with team cohesion and psychological capital predicting team productivity was not significant, $F_{(2, 172)} = 58.47, p < .001$; therefore, the fourth item of the method was not met.

Because of these results, the researcher determined that there was insufficient evidence to support psychological capital as a mediator in the relationship between team cohesion and team productivity. A post hoc power analysis was conducted, and the achieved power for the regression analysis was .60 (Faul et al., 2014). An ancillary regression analysis conducted between team cohesion and psychological capital was significant, $F_{(1, 759)} = 62.30, p < .001, R^2 = .08$, indicating that team cohesion is a predictor of psychological capital.

Chapter 5 presents a discussion of the findings from these analyses and the implications for future research and practice. Chapter 5 begins with a brief overview of the RQs and descriptions of the characteristics of the sample. A summary of the findings is included, followed by an interpretation of the results. The chapter discusses the implications for change and offers recommendations for further study. The chapter closes with a conclusion regarding the researcher's specific experience with the topic of the

current study and the potential for improvements within organizations based on the findings of this study.

Chapter 5: Discussion, Conclusions, and Recommendations

Study Overview

The purpose of the study was to investigate whether employees' psychological capital (i.e., hope, resilience, optimism, and self-efficacy) mediates the effects of team cohesion on team productivity. Examining how team cohesion influences employees' psychological states can help organizations to develop new teaming methodologies. These methodologies might support employees' psychological and emotional well-being while fostering increased productivity (Culbertson et al., 2010). The study addressed two primary RQs and entailed conducting a follow-on ancillary analysis

RQ1 asked, "Does team cohesion predict PMT productivity?" The regression was not significant, $F(1,43) = 0.01, p = .943, R^2 < .01$. The first item of Baron and Kenny's (1986) method was not met because the results suggested that team cohesion might not have been related to team productivity. Null Hypothesis 1 (i.e., Team cohesion, as assessed by the RGEQ, does not predict PMT productivity, as measured by the PMT MRS) cannot be rejected with sufficient evidence.

RQ2 asked, "Does psychological capital mediate the relationship between team cohesion and PMT productivity?" The multiple linear regression model was not significant: $F(2, 172) = 58.47, p < .001$, suggesting that team cohesion and psychological capital did not properly predict team productivity. Psychological capital was not a significant predictor of team productivity ($B = -6.18, p = .766$) while in the presence of team cohesion. Team cohesion was not a significant predictor of team productivity ($B = 2.31, p = .831$) while in the presence of psychological capital. Because the IV (team cohesion) was not significant in the presence of the mediator (psychological capital), the

fourth item of Baron and Kenny's (1986) method was not met. Thus, Null Hypothesis 2 (i.e., Psychological capital, as assessed by the PCQ-12, does not mediate the relationship between team cohesion, as assessed by the RGEQ, and PMT productivity, as assessed by the PMT MRS) cannot be rejected with sufficient evidence. There is insufficient statistical evidence to suggest that psychological capital is a mediator in the relationship between team cohesion and team productivity.

The ancillary analysis addressed the question, "Do individual team members' perceptions of their team cohesion predict their levels of psychological capital?" The simple linear regression model was significant, $F_{(1, 759)} = 62.30, p < .001, R^2 = .08$, indicating that 8% of the variation in psychological capital was accounted for by team cohesion. An analysis of the individual predictor indicated that team cohesion ($B = 0.26, p < .001$) was a significant predictor of psychological capital. This finding suggests that when team cohesion increases by one unit, psychological capital increases by 0.26.

Interpretation of the Results

The findings suggest that a significant relationship does not exist between team cohesion and productivity. This conclusion partially contradicts the research of Beal et al. (2003) and Van Zelst (1952) identifying a significant relationship between cohesion and performance. In these studies, the performance variable was a measure of supervisor ratings, which included a productivity component along with subjective components such as attitude, workplace demeanor, and quality of work. The current study used the productivity variable, which was quantitative, thus eliminating any elements of subjectivity. The findings suggest that the cohesion-performance relationship might be

driven more by supervisor perceptions of team cohesion.

These findings also contradict Luthans, Avolio, et al.'s (2007) and S. J. Peterson et al.'s (2011) research identifying a significant relationship between psychological capital and performance. Similar to the cohesion-performance studies mentioned previously, performance is measured by supervisor ratings, not pure productivity. The current study's findings suggest that psychological capital has an effect on the qualitative components that make up supervisor ratings.

The first characteristic of effective leader managers is the ability to form and maintain teams to achieve organizational objectives (Sinha, Merchant, Dangar, Agal, & Sharma, 2015). Bernstein (2015) stated that when key projects and initiatives fail, team members often cite a lack of teaming as the reason. Although many organizations have embraced teaming structures, it is important that leaders are clear on desired team outcomes as well as key contributors to team success. Cuthill et al. (2010) identified teaming as the grouping of members to share expertise and collaboration on projects to achieve mutually beneficial outcomes. Leaders who sponsor effective cohesion can raise team members' psychological states.

Although the results were not consistent with previous findings, future researchers have the opportunity to explore the scope of the variables used in this study. Gaining a deeper understanding of teaming relationships and their contribution to key workplace outcomes will be beneficial to many organizations. For instance, placing a focus on teaming configurations that sponsor workplace behaviors might contribute to such productivity outcomes as decreasing defects, less absenteeism, fewer team member

conflicts, and less stress. Using teaming to raise the psychological states of team members can support wellness within the workplace.

Limitations of the Study

A number of factors limited this study and the results:

1. Defense manufacturing requires precision tolerances and exacting manufacturing techniques. The technicians who perform this work are typically of a higher skill level than their counterparts in commercial manufacturing industries. Defense technicians are given extensive training prior to being placed on the manufacturing floor. This training and skill level contributes to less variability in manufacturing productivity.
2. The PMT MRS performance measurement system contains precise proprietary algorithms used to measure manufacturing performance. The performance measurement techniques used in this instrument allow for less variability than typical methods used in commercial industry.
3. Team size varied from 10 members to 34 members. The study did not account for differences in team size. Unequal weighting might have resulted in distortion of the data.
4. Individual performance data were not available for use because of privacy issues.
5. Individual cohesion and psychological capital scores had to be averaged to overall team scores, which might have had an effect on the fidelity of the data.
6. Achieved statistical power for team mediation was .60.
7. Limited travel funds required the researcher to limit team samples to one

geographical region.

Implications for Social Change

These findings inform members of professional practice in organizational psychology, academia, business, and manufacturing leadership. Industrial and organizational psychologists might be able to use the findings to leverage the relationship of individual cohesion to individual psychological capital to influence well-being and harmony within the organizations that they serve. Academics might expound upon these findings to tie additional outcomes that are functions of the cohesion-to-psychological-capital relationship. Businesses that seek new methodologies to motivate employees might choose to create cohesive environments within their organizations as a way to elevate the psychological states of team members. Manufacturing leaders might choose to leverage the instruments used in this study as a way to measure the levels of cohesion and psychological capital within their teams. These measures can be valuable when implementing organizational change such as productivity improvements, employee morale improvement initiatives, and overall well-being of the team members.

Recommendations for Further Study

The team relationships in the study did not show statistical significance and did not align with past research. This result suggested that the precise nature of defense manufacturing might have performance curves that are dramatically different from those in industries cited in past research. This study used productivity as the DV; past research has used performance as the DV. The current research did not support past findings indicating significant positive relationships between team cohesion and psychological

capital as predictors of performance. This result suggested that the performance construct was influenced by rater perceptions of employees' attitudes, behaviors, and compliance more than the pure productivity of the employees.

Future research should deeply explore the performance-productivity relationship. Having a better understanding of how these variables are influenced can offer new options to organizations seeking improvements to their ratings systems as well as manufacturing leaders seeking to increase productivity. It might be feasible to reconduct this study using performance as the DV. In this case, a positive significance achieved among team cohesion, psychological capital, and performance would exploit the difference between performance and productivity.

Additional defense manufacturers should be studied to determine whether productivity and performance relationships are industry-centric. A comparative study of industries outside of the defense arena also should be explored. The PMT MRS performance measurement system's algorithms are tailored to the specific business. The performance measurement techniques used in this instrument allow for less variability than typical methods used in commercial industry. Additional research that uses generalized time-keeping/performance methods might produce different results.

Using a team structure required averaging data that could have weakened their integrity. Future researchers who use discreet individual performance data might find significant relationships among the three variables. Using a larger team sample will offer greater statistical strength and might support a significant relationship. Unequal weighting based upon team size was not accounted for in this study and might have

distorted the results. The study can be reformed using teams of similar sample size while accounting for any variances in team size.

The results of this study indicated that individual cohesion is a predictor of individual psychological capital. Further research to understand the mediators and moderators between cohesion and psychological capital might offer additional insight into specific team dynamics that influence psychological capital. It also might offer a clearer understanding of the influencers of psychological capital. This study represented a relatively small sample of defense manufacturing workers, but it can serve as the impetus for future studies that will further validate and expand on the need to increase individual and team productivity.

Summary

The study was designed to measure whether team members' perceptions of team cohesion influence the psychological states of team members and whether these states have an effect on team productivity. Although the findings suggest that team cohesion is not a predictor of team productivity, they do show a significant relationship between individuals' cohesion and their psychological capital. Additional research that focuses on the cohesion-productivity relationship is needed to learn whether workplace venues beyond manufacturing more strongly support this relationship. The psychological capital-productivity relationship should be explored further to understand whether the subjective component of performance ratings has greater weight than productivity levels of employees and whether this subjectivity is influenced by the raters' psychological states. Productivity, when measured accurately, is an objective measure and should not be

confused with performance, which often contains subjective elements. Financial constraints limited the number of teams selected for the study. Replication of this study with a larger team sample size that supports a statistical power greater than .80 is recommended.

The team productivity measure was scored aggregately for each team because of privacy concerns. This scoring required that the team predictor variables be averaged. Additional research that eliminates averaging and measures the relationships independently to determine whether greater fidelity offers new insight is required.

Conclusion

It has been this researcher's experience that organizations spend an inordinate amount of time and money investing in technology and infrastructure while ignoring the potential of their team members. This research offers greater insight into the people component of the workplace and views teaming environments as those that promote the psychological well-being of employees while realizing greater efficiencies within the organization. Human resource departments, although often supportive, cannot accomplish this objective alone. This goal must be woven into the fabric of organizational leadership, who then must operationalize effective "people" strategies within their organizations to be successful.

References

- Affleck, G., Tennen, H., & Apter, A. (2001). Optimism, pessimism, and daily life with chronic illness. In E. Chang (Ed.), *Optimism and pessimism: Implications for theory, research, and practice* (pp. 147-168). Washington, DC: American Psychological Association. doi:10.1037/10385-007
- Avey, J. B., Avolio, B. J., Crossley, C. D., & Luthans, F. (2009). Psychological ownership: Theoretical extensions, measurement and relation to work outcomes. *Journal of Organizational Behavior, 30*(2), 173-191.
- Avey, J. B., Luthans, F., Smith, R. M., & Palmer, N. F. (2010). Impact of positive psychological capital on employee well-being over time. *Journal of Occupational Health Psychology, 15*(1), 17. doi:10.1037/a0016998
- Avey, J. B., Patera, J. L., & West, B. J. (2006). Positive psychological capital: A new lens to view absenteeism. *Journal of Leadership and Organizational Studies, 13*(1), 42-60.
- Avey, J. B., Wernsing, T. S., & Luthans, F. (2008). Can positive employees help positive organization change? Impact of psychological capital and emotions on relevant attitudes and behaviors. *Journal of Applied Behavioral Science, 44*(1), 48-70.
- Baker, T. B. (2009). *The new employment relationship model*. Retrieved from http://www.winnersatwork.com.au/publications/article_new_employment_relationship_model.pdf
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall. doi:10.4135/9781446221129.n6

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Bandura, A. (1999). Social cognitive theory: An agentic perspective. *Asian Journal of Social Psychology*, 2(1), 21-41. doi:10.1111/1467-839X.00024
- Bandura, A., & Barab, P. G. (1973). Processes governing disinhibitory effects through symbolic modeling. *Journal of Abnormal Psychology*, 82(1), 1-9.
doi:10.1037/h0034968
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173.
- Battisti, G., & Iona, A. (2009). The UK productivity gap in the service sector: Do management practices matter? *International Journal of Productivity and Performance Management*, 58(8), 727-747. doi:10.1108/17410400911000381
- Beal, D. J., Cohen, R., Burke, M. J., & McLendon, C. L. (2003). Cohesion and performance in groups: A meta-analytic clarification of construct relation. *Journal of Applied Psychology*, 88(6), 989-1004. doi:10.1037/0021-9010.88.6.989
- Berkowitz, L. (1954). Group standards, cohesiveness, and productivity. *Human Relations*, 7(4), 509-519. doi:10.1177/001872675400700405
- Bernstein, E. (2015). *Leadership and teaming*. Harvard Business School Background Note 414-033, September 2013. (Rev. August 2015)

- Besieux, T., Baillien, E., Vander Elst, T., & Euwema, M. (2012). *Transformational leadership and customer satisfaction: Mediation of team cohesion*. International Association for Conflict Management 25th annual conference, Stellenbosch, South Africa.
- Betts, S. C., & Santoro, M. D. (2014). Champions and trust as drivers of industry/university collaborations: A relationship marketing perspective. In T. Kliewe (Ed.), *Modern concepts of organizational marketing* (pp. 269-284). Wiesbaden, Germany. Springer Fachmedien. doi:10.1007/978-3-658-04680-4_16
- Bollen, K. A., & Hoyle, R. H. (1990). Perceived cohesion: A conceptual and empirical examination. *Social Forces*, 69(2), 479-504. doi:10.2307/2579670
- Bontis, N., Hardie, T., & Serenko, A. (2008). Self-efficacy and KM course weighting selection: Can students optimize their grades? *International Journal of Teaching and Case Studies*, 1(3), 189-199.
- Boone, H. N., & Boone, D. A. (2012). Analyzing Likert data. *Journal of Extension*, 50(2). Retrieved from <http://www.joe.org/>
- Buchanan, G. M., & Seligman, M. E. P. (Eds.) (1995). *Explanatory style*. Hillsdale, NJ: Erlbaum.
- Bukowski, W. M., & Cillessen, A. H. (1998). *Sociometry then and now: Building on six decades of measuring children's experiences with the peer group*. San Francisco, CA: Jossey-Bass.

- Burt, R. (2002). The social capital of structural holes. In M. F. Guillén, R. Collins, P. England, & M. Meyer (Eds.), *The new economic sociology* (pp. 148-192). New York, NY: Russell Sage Foundation.
- Cameron, K. S., Dutton, J. E., & Quinn, R. E. (2003). *Positive organizational scholarship*. San Francisco, CA: Berrett-Koehler. doi:10.4135/9781412956246.n431
- Carless, S. A., & De Paola, C. (2000). The measurement of cohesion in work teams. *Small Group Research, 31*(1), 71-88. doi:10.1177/104649640003100104
- Carr, A. (2011). *Positive psychology: The science of happiness and human strengths*. New York, NY: Brunner-Routledge.
- Carron, A. V., & Brawley, L. R. (2000). Cohesion: Conceptual and measurement issues. *Small Group Research, 31*(1), 89-106. doi:10.1177/104649640003100105
- Carver, C. S., Scheier, M. E., & Segerstrom, S. C. (2010). Optimism. *Clinical Psychology Review, 30*(1), 879-889. doi:10.1016/j.cpr.2010.01.006
- Caves, R. E. (1982). *Multinational enterprise and economic analysis*. Cambridge, UK: Cambridge University Press. doi:10.1017/CBO9780511619113
- Cha, M., Park, J. G., & Lee, J. (2014). Effects of team member psychological proximity on teamwork performance. *Team Performance Management, 20*(1/2), 81-96.
- Cheung, F., Tang, C. S., & Tang, S. (2011). Psychological capital as a moderator between emotional labor, burnout, and job satisfaction among school teachers in China. *International Journal of Stress Management, 18*(4), 348-371.
<http://dx.doi.org/10.1037/a0025787>

- Cobb, C. W., & Douglas, P. H. (1928). A theory of production. *American Economic Review*, 18(1), 139-165.
- Conti, R., Angelis, J., Cooper, C., Faragher, B., & Gill, C. (2006). The effects of lean production on worker job stress. *International Journal of Operations and Production Management*, 26(9), 1013-1038.
- Cota, A. A., Dion, K. L., & Evans, C. R. (1993). A reexamination of the structure of the Gross Cohesiveness Scale. *Educational and Psychological Measurement*, 53(2), 499-506. doi:10.1177/0013164493053002019
- Cotton, E. (2011). Workplace resilience initiatives are on the increase in the current recession, but do they offer us a real way forward? British Politics and Policy at LSE. Retrieved from <http://blogs.lse.ac.uk/>
- Craig, C. E., & Harris, R. C. (1973). Total productivity measurement at the firm level. *Sloan Management Review*, 14(3), 13-29.
- Culbertson, S. S., Fullagar, C. J., & Mills, M. J. (2010). Feeling good and doing great: The relationship between psychological capital and well-being. *Journal of Occupational Health Psychology*, 15(4), 421-433. doi:10.1037/a0020720
- Cummins, J. D., & Weiss, M. A. (2013). Analyzing firm performance in the insurance industry using frontier efficiency and productivity methods. In G. Dionne (Ed.), *Handbook of insurance* (pp. 795-861). New York, NY: Springer. doi:10.1007/978-1-4614-0155-1_28

- Cuthill, J., Roach, A. D., & Atze, S. (2010). *Teaming and its place in Australia's defence sector. South Australian Defence Industry Leadership Program*. Retrieved from <http://www.dtc.org.au/Documents/136.pdf>
- Das, D. K., & Kalita, G. (2009). Are labor-intensive industries generating employment in India? Evidence from form level survey. *Indian Journal of Labour Economics*, 52(3), 411-432.
- De Vries, R. E., Van den Hooff, B., & de Ridder, J. A. (2006). Explaining knowledge sharing the role of team communication styles, job satisfaction, and performance beliefs. *Communication Research*, 33(2), 115-135.
- Dion, K. L. (2000). Group cohesion: From "field of forces" to multidimensional construct. *Group Dynamics: Theory, Research, and Practice*, 4(1), 7-26.
doi:10.1037//1089-2699.4.1.7
- Donaldson, S. I., & Ko, I. (2010). Positive organizational psychology, behavior, and scholarship: A review of the emerging literature and evidence base. *Journal of Positive Psychology*, 5(3), 177-191. doi:10.1080/17439761003790930
- Dutton, J. (2008). Positive organizational scholarship. *SAGE Handbook of Organizational Behavior*, 1(1), 693-712. doi:10.4135/9781849200448.n37
- Dutton, J., Glynn, M. A., & Spreitzer, G. (2006). Positive organizational scholarship. In J. H. Greenhaus & G. A. Callanan (Eds.), *Encyclopedia for career development* (pp. 641-644). Thousand Oaks, CA: Sage. doi:10.4135/9781412952675.n223
- Dyaram, L., & Kamalanabhan, T. J. (2005). Unearthed: The other side of group cohesiveness. *Journal of Social Science*, 10(3), 185-190.

- Epitropaki, O. (2013). A multi-level investigation of psychological contract breach and organizational identification through the lens of perceived organizational membership: Testing a moderated-mediated model. *Journal of Organizational Behavior, 34*(1), 65-86. doi:10.1002/job.1793
- Evans, C. R., & Dion, K. L. (2012). Group cohesion and performance A meta-analysis. *Small Group Research, 43*(6), 690-701. doi:10.1177/1046496412468074
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2014). G*Power version 3.1.9.2 [computer software]. Retrieved from <http://www.psych.uni-duesseldorf.de/>
- Fiscal Year 2014 budget request.* (2013). Retrieved from http://comptroller.defense.gov/defbudget/fy2014/FY2014_Budget_Request.pdf
- French, J. R. P., Jr. (1941). The disruption and cohesion of groups. *Journal of Abnormal and Social Psychology, 36*(3), 361-377. doi:10.1037/h0057883
- Forsyth, D. R. (2009). *Group dynamics* (5th ed.). Pacific Grove, CA: Brooks/Cole.
- Forsyth, D. R., Zyzanski, L. E., & Giammanco, C. A. (2002). Responsibility diffusion in cooperative collectives. *Personality and Social Psychology Bulletin, 28*(1), 54-65.
- Fowler, R. D., Seligman, M. E. P., & Koocher, G. P. (1999). The APA annual report. *American Psychologist, 54*(8), 537-568.
- Fruhen, L. S., & Keith, N. (2014). Team cohesion and error culture in risky work environments. *Safety Science, 65*, 20-27. doi:10.1016/j.ssci.2013.12.011
- Fukuyama, F. (1997). Social capital and the modern capitalist economy: Creating a high trust workplace. *Stern Business Magazine, 4*(1), 1-16.

- Furnham, A. (2005). *The psychology of behaviour at work: The individual in the organization* (2nd ed.). New York, NY: Psychology Press.
- Gibson, B., & Sanbonmatsu, D. M. (2004). Optimism, pessimism and gambling: The downside of optimism. *Personality and Social Psychology Bulletin*, 30(2), 149-160. doi:10.1177/0146167203259929
- Giordano, P. C. (2003). Relationships in adolescence. *Annual Review of Sociology*, 29(1), 257-281.
- Gorgens-Ekermans, G., & Herbert, M. (2013). Psychological capital: Internal and external validity of the Psychological Capital Questionnaire (PCQ-24) on a South African sample. *South African Journal of Industrial Psychology*, 39(2), 1-12. dx.doi.org/10.4102/sajip.v39i2.1131
- Grawitch, M. J., Trares, S., & Kohler, J. M. (2007). Healthy workplace practices and employee outcomes. *International Journal of Stress Management*, 14(3), 275. doi:10.1037/1072-5245.14.3.275
- Gray, D., & Vander Wal, T. (2012). The connected company. Retrieved from <http://communicationnation.blogspot.de/>
- Greenberg, E. S., Sikora, S. B., Grunberg, L., & Moore, S. (2012). *Work teams and organizational commitment: Exploring the influence of the team experience on employee attitudes*. Working paper: Institute of Behavioral Science, University of Colorado.

- Guertin, N., & Womble, B. (2012). *Competition and the DoD marketplace*. In Proceedings of the ninth annual acquisition research symposium (Vol. 1, pp. 76-82). Monterey, CA: Naval Postgraduate School.
- Guest, D. E. (1998). Is the psychological contract worth taking seriously? *Journal of Organizational Behavior*, *19*(1), 649-664. doi:10.1002/(SICI)1099-1379(1998)19:1+%3C649::AID-JOB970%3E3.0.CO;2-T
- Gully, S. M., Devine, D. J., & Whitney, D. J. (1995). A meta-analysis of cohesion and performance: Effects of level of analysis and task interdependence. *Small Group Research*, *26*(4), 497-520. doi:10.1177/1046496495264003
- Gunasekaran, A., McNeil, R., McGaughey, R., & Ajasa, T. (2001). Experiences of a small to medium size enterprise in the design and implementation of manufacturing cells. *International Journal of Computer Integrated Manufacturing*, *14*(2), 212-223.
- Guzzo, R. A., & Dickson, M. W. (1996). Teams in organizations: Recent research on performance and effectiveness. *Annual Review of Psychology*, *47*(1), 307-338. doi:10.1146/annurev.psych.47.1.307
- Hackman, J. R. (1992). *Group influences on individuals in organizations*. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1455-1525). Palo Alto, CA: Consulting Psychologists Press.
- Hackman, J. R., & Wageman, R. (2005). A theory of team coaching. *Academy of Management Review*, *30*(2), 269-287. doi:10.5465/AMR.2005.16387885

- Han, X., Xue, X., Ge, J., Wu, H., & Su, C. (2014). Measuring the productivity of energy consumption of major industries in China: A DEA-based method. *Mathematical Problems in Engineering*, 2014(1-12). doi:10.1155/2014/121804
- Hanlan, M. (2004). *High performance teams: How to make them work*. Westport, CT: Praeger.
- Harter, J. K., Schmidt, F. L., & Keyes, C. L. (2003). Well-being in the workplace and its relationship to business outcomes: A review of the Gallup studies. *Flourishing: Positive Psychology and the Life Well-Lived*, 2(1), 205-224.
- Harter, J. K., Schmidt, F. L., Killham, E. A., & Agrawal, S. (2009). *Gallup Q12 meta-analysis: The relationship between engagement at work and organizational outcomes*. Omaha, NE: Gallup.
- Hartfiel, N., Havenhand, J., Khalsa, S. B., Clarke, G., & Krayner, A. (2011). The effectiveness of yoga for the improvement of well-being and resilience to stress in the workplace. *Scandinavian Journal of Work and Environmental Health*, 37(1), 70-76. doi:10.5271/sjweh.2916
- Harwell, M. R., & Gatti, G. G. (2001). Rescaling ordinal data to interval data in educational research. *Review of Educational Research*, 71(1), 105-131.
- Heniff, B., Rybicki, E., & Mahan, S. M. (2011). *The Budget Control Act of 2011*. Congressional Research Service, Library of Congress.
- Heshmati, A. (2003). Productivity growth, efficiency and outsourcing in manufacturing and service industries. *Journal of Economic Surveys*, 17(1), 79-112. doi:10.1111/1467-6419.00189

- Hogg, M. A. (1993). Group cohesiveness: A critical review and some new directions. *European Review of Social Psychology*, 4(1), 85-111. doi:10.1080/14792779343000031
- Hoyle, R. H., & Crawford, A. M. (1994). Use of individual-level data to investigate group phenomena: Issues and strategies. *Small Group Research*, 25(4), 464-485. doi:10.1177/1046496494254003
- Huang S. H., Dismukes J. P., Mousalam, A., Razzak, R. B., & Robinson, D. E. (2003). Manufacturing productivity improvement using effectiveness metrics and simulation analysis. *International Journal of Production Research*, 41(3), 513-527. doi:10.1080/0020754021000042391
- Hulten, C. R. (2001). Total factor productivity. A short biography. In C. R. Hulten, E. R. Dean, & M. J. Harper (Eds.), *New developments in productivity analysis* (pp. 1-54). Chicago, IL: University of Chicago Press.
- Isaacowitz, D. M., & Seligman, M. E. P. (2002). Cognitive style predictors of affect change in older adults. *International Journal of Aging and Human Development*, 54(3), 233-253. doi:10.2190/J6E5-NP5K-2UC4-2F8B
- Jackson, T., & Victor, P. (2011). Productivity and work in the “green economy”: Some theoretical reflections and empirical tests. *Environmental Innovation and Societal Transitions*, 1(1), 101-108.
- Jamieson, S. (2004). Likert scales: How to use them. *Medical Education*, 38(12), 1217-1218.

- Janis, I. L. (1982). *Groupthink: Psychological studies of policy decisions and fiascoes* (2nd ed.). Boston, MA: Houghton Mifflin.
- Jaskyte, K., & Dressler, W. W. (2005). Organizational culture and innovation in nonprofit human service organizations. *Administration in Social Work, 29*(2), 23-41. doi:10.1300/J147v29n02_03
- Kathawala, Y., Zhang, R., & Shao, J. (2005). Global outsourcing and its impacts on organisations: Problems and issues. *International Journal of Service Operations Management, 1*(2), 185-202. doi:10.1504/IJSOM.2005.006496
- Katzenbach, J. R. (2000). *Peak performance, aligning the hearts and minds of your employees*. Boston, MA: Harvard Business School Press.
- Kearney, A. T. (2011). Affordability in the U.S. Defense Department: A better approach to dealing with declining DoD budgets. Retrieved from <http://www.atkearney.com/>
- Kenny, D. A., & Judd, C. M. (2013). Power anomalies in testing mediation. *Psychological Science, 25*(2), 334-339. doi:10.1177/0956797613502676
- Laschinger, H. K. S., & Grau, A. L. (2012). The influence of personal dispositional factors and organizational resources on workplace violence, burnout, and health outcomes in new graduate nurses: A cross-sectional study. *International Journal of Nursing Studies, 49*(3), 282-291. <http://dx.doi.org/10.1016/j.ijnurstu.2011.09.004>

- Liu, L., Chang, Y., Fu, J., Wang, J., & Wang, L. (2012). The mediating role of psychological capital on the association between occupational stress and depressive symptoms among Chinese physicians: A cross-sectional study. *BMC Public Health, 12*, 219-227. <http://dx.doi.org/10.1186/1471-2458-12-219>
- Lopez, S. J., & Snyder, C. R. (Eds.). (2011). *The Oxford handbook of positive psychology*. New York, NY: Oxford University Press.
- Lott, A. J., & Lott, B. E. (1965). Group cohesiveness as interpersonal attraction: a review of relationships with antecedent and consequent variables. *Psychology Bulletin, 64*, 259-309. doi:10.1037/h0022386
- Luszczynska, A., & Schwarzer, R. (2005). Multidimensional health locus of control: Comments on the construct and its measurement. *Journal of Health Psychology, 10*(5), 633-642. doi:10.1177/1359105305055307
- Luthans, F. (2002). The need for and meaning of positive organizational behavior. *Journal of Organizational Behavior, 23*(6), 695-706.
- Luthans, F., Avey, J. B., Avolio, B. J., & Peterson, S. J. (2010). The development and resulting performance impact of positive psychological capital. *Human Resource Development Quarterly, 2*(1), 41-67. doi.org/10.1002/hrdq.20034
- Luthans, F., Avey, J. B., & Patera, J. L. (2008). Experimental analysis of a web-based training intervention to develop positive psychological capital. *Academy of Management Learning & Education, 7*(2), 209-221. doi:10.5465/AMLE.2008.3271 2618

- Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive psychological capital: Measurement and relationship with performance and satisfaction. *Personnel Psychology, 60*(3), 541-572.
- Luthans, F., Avolio, B. J., Walumbwa, F. O., & Li, W. (2005). The psychological capital of Chinese workers: Exploring the relationship with performance. *Management and Organization Review, 1*(2), 249-271. doi:10.1111/j.1740-8784.2005.00011.x
- Luthans, F., Norman, S. M., Avolio, B. J., & Avey, J. B. (2008). The mediating role of psychological capital in the supportive organizational climate employee performance relationship. *Journal of Organizational Behavior, 29*(2), 219-238. doi:10.1002/job.507
- Luthans, F., & Youssef, C. M. (2004). Human, social, and now positive psychological capital management: Investing in people for competitive advantage. *Organizational Dynamics, 33*(2), 143-60.
- Luthans, F., Youssef, C., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge*. Oxford, England: Oxford University Press.
- Margolis, J. D., & Stoltz, P. G. (2010). How to bounce back from adversity. *Harvard Business Review, 88*(1-2), 86-92.
- Maynard, M. T., Mathieu, J. E., Gilson, L. L., O'Boyle, E. H., & Cigularov, K. P. (2013). Drivers and outcomes of team psychological empowerment A meta-analytic review and model test. *Organizational Psychology Review, 3*(2), 101-137. doi:10.1177/2041386612456868

- Meredith, L. S., Sherbourne, C. D., & Gaillot, S. J. (2011). *Promoting psychological resilience in the US military*. Santa Monica, CA: RAND Corporation.
- McLeod, J., & Von Treuer, K. (2013). Towards a cohesive theory of cohesion. *International Journal of Business and Social Research*, 3(12), 1-11.
- McNulty, J. K., & Fincham, F. D. (2012). Beyond positive psychology? Toward a contextual view of psychological processes and well-being. *American Psychologist*, 67(2), 101. doi:10.1037/a0024572
- Mudrack, P. E. (1989). Group cohesiveness and productivity: A closer look. *Human Relations*, 42(9), 771-785. doi:10.1177/001872678904200902
- Mullen, B., & Copper, C. (1994). The relation between group cohesiveness and performance: An integration. *Psychological Bulletin*, 115(2), 210. doi:10.1037/033-2909.115.2.210
- Norem, J. K. (2001). *The positive power of negative thinking*. New York, NY: Basic Books.
- Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in Health Sciences Education*, 15(5), 625-632.
- Ormrod, J. E. (2006). *Educational psychology: Developing learners* (5th ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.
- Owen, W. F. (1985). Metaphor analysis of cohesiveness in small discussion groups. *Small Group Behavior*, 16(3), 415-424. doi:10.1177/0090552685163011

- Parke, B., & Orasanu, J. (2012, September). Portraying the contribution of individual behaviors to team cohesion and performance. In *Proceedings of the Human Factors and Ergonomics Society annual meeting* (Vol. 56[1], pp. 1084-1088). SAGE. doi:10.1177/1071181312561236
- Peale, N. V. (1952). *The power of positive thinking*. New York, NY: Prentice-Hall.
- Pepitone, A., & Reichling, G. (1955). Group cohesiveness and the expression of hostility. *Human Relations, 8*, 327-337. doi:10.1177/001872675500800306
- Peterson, C. (2006). *Primer in positive psychology*. New York, NY: Oxford University Press.
- Peterson, C., Park, N., & Kim, E. S. (2012). Can optimism decrease the risk of illness and disease among the elderly? *Aging Health, 8*(1), 5-8.
- Peterson, S. J., Luthans, F., Avolio, B. J., Walumbwa, F. O., & Zhang, Z. (2011). Psychological capital and employee performance: A latent growth modeling approach. *Personnel Psychology, 64*(2), 427-450. doi:10.1111/j.1744-6570.2011.01215.x
- Pierce, J. L., Kostova, T., & Dirks, K. (2001). Toward a theory of psychological ownership in organizations. *Academy of Management Review, 26*(2), 298-310. doi:10.2307/259124
- Pineda, A. (1990). *A multiple case study research to determine and respond to management information need using total-factor productivity measurement (TFPM)*. Blacksburg: Virginia Polytechnic Institute and State University.

- Reichard, R. J., Avey, J. B., Lopez, S., & Dollwet, M. (2013). Having the will and finding the way: A review and meta-analysis of hope at work. *Journal of Positive Psychology, 8*(4), 292-304. doi:10.1080/17439760.2013.800903
- Rempel, M. W., & Fisher, R. J. (1997). Perceived threat, cohesion, and group problem solving in intergroup conflict. *International Journal of Conflict Management, 8*(3), 216-234. doi:10.1108/eb022796
- Renn, R. W., & Vandenberg, R. J. (1995). The critical psychological states: An underrepresented component in job characteristics model research. *Journal of Management, 21*(2), 279-303.
- Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of Management Journal, 53*(3), 617-635. doi:10.5465/AMJ.2010.51468988
- Richards, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2008). *Measuring organizational performance as a dependent variable: Towards methodological best practice*. Retrieved from http://www.researchgate.net/publication/228136632_Measuring_Organizational_Performance_as_a_Dependent_Variable_Towards_Methodological_Best_Practice/file/9fcfd5080dcfcb36f3.pdf
- Rosh, L., Offermann, L. R., & Van Diest, R. (2012). Too close for comfort? Distinguishing between team intimacy and team cohesion. *Human Resource Management Review, 22*(2), 116-127. doi:10.1016/j.hrmr.2011.11.004
- Rothbard, N. P., & Patil, S. V. (2012). *Work engagement*. New York, NY: Oxford University Press.

- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80(1), 1.
- Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass*, 5(6), 359-371. doi:10.1111/j.1751-9004.2011.00355.x
- Rummler, G. A., & Brache, A. P. (2012). *Improving performance: How to manage the white space on the organization chart*. San Francisco, CA: Jossey-Bass.
- Ruthig, J. C., Haynes, T. L., Stupinsky, R. H., & Perry, R. P. (2009). Perceived academic control: Mediating the effects of optimism and social support on college students' psychological health. *Social Psychology of Education*, 12(2), 233-249.
- Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology*, 21(7), 600-619.
- Salas, E., Cooke, N. J., & Rosen, M. A. (2008). On teams, teamwork, and team performance: Discoveries and developments. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 50(3), 540-547.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (2001). Optimism, pessimism, and psychological well-being. In E. C. Chang (Ed.), *Optimism and pessimism: Implications for theory, research, and practice* (pp. 189-216). Washington, DC: American Psychological Association. doi:10.1037/10385-009
- Schneider, K. (2011). Toward a humanistic positive psychology. Existential analysis: *Journal of the Society for Existential Analysis*, 22(1), 32-38.

- Schreyer, P. (2001). *Measuring productivity: OECD manual. Measurement of aggregate and industry-level productivity growth*. Paris, France: OECD.
- Schulman, P. (1999). Applying learned optimism to increase sales productivity. *Journal of Personal Selling and Sales Management*, 29(1), 31-37.
- Seligman, M. E. (1998). *Learned optimism* (2nd ed.). New York, NY: Pocket Books.
- Seligman, M. E. (2002a). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. New York, NY: Free Press.
- Seligman, M. E. (2002b). Positive psychology, positive prevention, and positive therapy. *Handbook of Positive Psychology*, 2, 3-12.
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychological Association*, 55(1), 5-6.
- Seligman, M. E., Rashid, T., & Parks, A. C. (2006). Positive psychotherapy. *American Psychologist*, 61(8), 774.
- Shahidul, M. I., & Shazali, S. S. (2011). Dynamics of manufacturing productivity: Lesson learnt from labor intensive industries. *Journal of Manufacturing Technology Management*, 22(5), 664-678.
- Shepperd, J. A., & McNulty, J. K. (2002). The affective consequences of expected and unexpected outcomes. *Psychological Science*, 13(1), 85-88. doi:10.1111/1467-9280.00416

- Sinha, V., Merchant, A., Dangar, N., Agal, P., & Sharma, P. (2015). Comparative study on workplace collaboration across the leading global organizations in IT sector. *International Journal of Human Capital and Information Technology Professionals*, 6(2), 14-32. doi:10.4018/IJHCITP.2015040102
- Smit, A. J. (2010). The competitive advantage of nations: Is Porter's diamond framework a new theory that explains the international competitiveness of countries? *Southern African Business Review*, 14(1), 105-130.
- Snyder, C. R. (2000). *Handbook of hope*. San Diego, CA: Academic Press.
- Snyder, C. R., Lopez, S. J., & Pedrotti, J. T. (2011). *Positive psychology: The scientific and practical exploration of human strengths*. Thousand Oaks, CA: Sage.
- Sorenson, S., & Garman, K. (2013). How to tackle U.S. employees' stagnating engagement. Retrieved from <http://businessjournal.gallup.com/>
- Soros, G. (2009). *The crash of 2008 and what it means: The new paradigm for financial markets*. New York, NY: Public Affairs.
- Stoltz, P. G. (1997). *Adversity quotient: Turning obstacles into opportunities*. New York, NY: John Wiley & Sons.
- Thompson, W. R., & Rapkin, D. P. (1981). Collaboration, consensus, and detente: The external threat-bloc cohesion hypothesis. *Journal of Conflict Resolution*, 25(4), 615-637.
- Tripathi, P. (2011). Employee well-being: Role of psychological capital. *Amity Journal of Applied Psychology*, 2(1), 18-22.

- Van Loggarenberg, B., & Cucchiaro, S. (1982). Productivity measurement and the bottom line. *National Productivity Review*, 1(1), 87-99. doi:10.1002/npr.4040010111
- Van Zelst, R. H. (1952). Sociometrically selected work teams increase production. *Personnel Psychology*, 5(3), 175-185. doi:10.1111/j.1744-6570.1952.tb01010.x
- Vaughan, S. C. (2000). *Half empty, half full: Understanding the psychological roots of optimism*. New York, NY: Harcourt.
- Wagnild, G. M., & Young, H. M. (1993). Development and psychometric evaluation of the Resilience Scale. *Journal of Nursing Measurement*, 1(2), 165-178.
- Walker, D., & Hampson, K. (Eds.). (2003). *Procurement strategies: A relationship based approach*. Oxford, UK: Blackwell.
- Wang, Y., Chang, Y., Fu, J., & Wang, L. (2012). Work-family conflict and burnout among Chinese female nurses: The mediating effect of psychological capital. *BMC Public Health*, 12, 915-923. <http://dx.doi.org/10.1186/1471-2458-12-915>
- Watts, B. D. (2008). *The US defense industrial base: Past, present, and future*. Washington, DC: Center for Strategic and Budgetary Assessments.
- Wey Smola, K., & Sutton, C. D. (2002). Generational differences: Revisiting generational work values for the new millennium. *Journal of Organizational Behavior*, 23(4), 363-382. doi:org/10.1002/job.147
- Wrosch, C., Miller, G. E., Scheier, M. F., & Brun de Pontet, S. (2007). Giving up on unattainable goals: Benefits for health? *Personality and Social Psychology Bulletin*, 33, 251-265. doi:10.1177/0146167206294905

- Youssef, C. M., & Luthans, F. (2007). Positive organizational behavior in the workplace: The impact of hope, optimism, and resilience. *Journal of Management*, 33(5), 774-800.
- Zaccaro, S. J. (1991). Nonequivalent associations between forms of cohesiveness and group-related outcomes: Evidence for multidimensionality. *Journal of Social Psychology*, 131(3), 387-399. doi:10.1080/00224545.1991.9713865
- Zaccaro, S. J., Gualtieri, J., & Minionis, D. (1995). Task cohesion as a facilitator of team decision making under temporal urgency. *Military Psychology*, 7(2), 77-93. doi:10.1207/s15327876mp0702_3
- Zaccaro, S. J., & Lowe, C. A. (1988). Cohesiveness and performance on an additive task: Evidence for multidimensionality. *Journal of Social Psychology*, 128(4), 547-558. doi:10.1080/00224545.1988.9713774
- Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197-206. doi:10.1086/651257

Appendix A: Psychological Capital Questionnaire

Purpose. The purpose of this survey is to determine your current level of psychological capital. Psychological Capital is a positive state-like capacity that is defined as an individual's positive psychological state of development.

Directions. Below are statements about you with which you may agree or disagree. Using the following Likert scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *somewhat agree*, 5 = *agree*, 6 = *strongly agree*), indicate your level of agreement or disagreement with each statement.

- ___ 1. I feel confident in representing my work area in meetings with management.
- ___ 2. I feel confident contributing to discussions about the company's strategy.
- ___ 3. I feel confident presenting information to a group of colleagues.
- ___ 4. If I find myself in a jam at work, I could think of many ways to get out of it.
- ___ 5. Right now I see myself as being pretty successful at work.
- ___ 6. I can think of many ways to reach my current work goals.
- ___ 7. At this time, I am meeting the work goals that I have set for myself.
- ___ 8. I can be “on my own” so to speak at work if I have to.
- ___ 9. I usually take stressful things at work in stride.
- ___ 10. I can get past difficult times at work because I've experienced difficulty before.
- ___ 11. I always look on the bright side of things regarding my job.
- ___ 12. I'm optimistic about what will happen to me in the future as it pertains to work.

Source: Luthans, F., Avolio, B., Avey, J. B., & Norman, S. M. (2007). Psychological capital: Measurement and relationship with performance and job satisfaction. *Personnel Psychology*, 60, 541-572.

Appendix B: Revised Group Environment Questionnaire

Purpose. The Revised Group Environment Questionnaire (RGEQ) is a measure of group cohesion that has a long history of use in sports psychology and group research. This questionnaire assesses your current perception level of cohesiveness amongst you and your team members

Directions. Below are statements that describe your perceptions of cohesion within your group. Use the following scale: 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree, to indicate your level of agreement or disagreement with each statement.

- ___ 1. Our team is united in trying to reach its goals for performance.
- ___ 2. I'm unhappy with my team's level of commitment to the task
- ___ 3. Our team members have conflicting aspirations for the team's performance (R)
- ___ 4. This team does not give me enough opportunities to improve my personal performance (R)
- ___ 5. Our team would like to spend time together outside of work hours
- ___ 6. Members of our team do not stick together outside of work time (R)
- ___ 7. Our team members rarely socialize together (R)
- ___ 8. Members of our team would rather go out on their own than get together as a team (R)
- ___ 9. For me this team is one of the most important social groups to which I belong
- ___ 10. Some of my best friends are in this team

Note: R indicates reverse scoring.

Source: Carless, S. A., & De Paola, C. (2000). The measurement of cohesion in work teams. *Small Group Research*, 31(1), 71-88.

Appendix C: Performance Measurement Team Manufacturing Resource System

Performance Measurement Team (PMT) Manufacturing Resource System (MRS) is a manufacturing resource planning tool that measures productivity by assessing the amount of time spent by a technician to build a defined standard unit of work. Manufacturing technicians electronically scan the start and completion of their build process. The PMT MRS measures the actual time taken to complete the process against the defined standard time and creates a productivity percentage. The PMT MRS output is depicted in Figure C1.

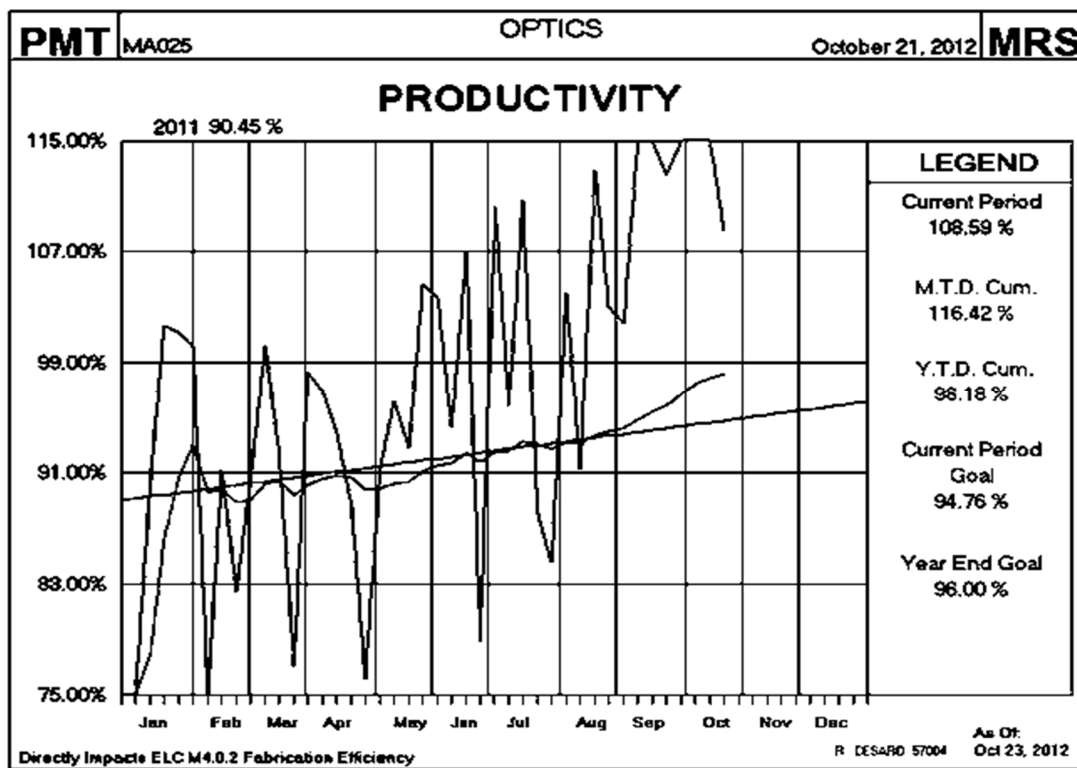


Figure C1. Sample PMT MRS productivity metric.

During the kitting process, a barcoded sticker is applied to each part’s container. The manufacturing technician scans the barcode with a barcode scanner to begin the time

sequence. The data are entered into the PMT MRS database. Upon completion of the process, the technician scans the barcode to signify completion of the process. The PMT MRS software automatically calculates the time taken to complete the process and compares this time to an expected standard time. This expected standard unit of time is preentered into the database. The PMT MRS divides the actual time taken into the expected standard time. A productivity percentage is calculated and recorded in the database. These data are coded for each PMT so that team productivity can be measured and discussed by team members.