

ANTECEDENTS AND OUTCOMES ASSOCIATED WITH
THE INDIVIDUAL STRESS
RESPONSE

by

MATTHEW BLAKE HARGROVE

Presented to the Faculty of the Graduate School of
The University of Texas at Arlington in Partial Fulfillment
of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

August 2012

Copyright © by M. Blake Hargrove 2012

All Rights Reserved

For Mary Katherine Baird Darmer. You are missed.

ACKNOWLEDGEMENTS

Without the unending support of my wife Debra, I never would have finished this document or my doctorate. She is everything to me - my best friend, my partner in life, my editor, my truest critic, and my most loyal supporter. She is the best wife and mother I know. For the past four years, she has carried the weight of our home and family on her often-sore back without complaint. Her commitment required me, in equity, to complete my dissertation and doctoral studies. She is my moon and my stars.

The best decision I made as a graduate student was to choose Jim Quick as a mentor and dissertation chair. Jim was always there to keep me on track, hold me accountable, and provide intellectual support. I appreciate his time, care, and discipline. His voice has joined the select chorus of voices that inform my conscience.

I would also like to thank the other members of my committee. My co-chair Gary McMahan, my methods professor Wendy Casper, and my outside member Joel Bennett made important contributions to my development as a scholar.

Of course, I owe everything to my mother and father. It was my mother who set me on the path as a teacher and scholar when she encouraged me to apply for a teaching job in management. I owe a questioning mind to my father who over hundreds of meals and car rides and thousands of conversations has taught me to push myself intellectually

I acknowledge the love and support of my larger family. My brothers David, John, and Brian along with my sister Linda have held me in their thoughts and prayers. My eldest niece Martha's typing and organizational help was crucial. My extended family also has played a role. Each of my aunts and uncles helped form me as a person and has loved me from far and near. My uncle Bobby is my Platonic form of a college professor. All my beloved cousins are never far from my mind. Three deserve special mention: Elizabeth for her love and care of my wife and family, Joe for his companionship, and Susan for her empathy and attention.

Friends sustained me through this process. Arnold, Bill, and Drew kept me humble at all times. I treasure my time and friendship with these three fine men. Drew's generosity to me with regard to this study will not be forgotten. Tom taught me how to study, Roberta and David cared for me and my family, and Marcos and Mauricio buoyed my balance sheet. I thank my colleagues at McLennan Community College, especially Nancy, Jennifer, Paul, and Brooks. At UTA, Wendy and Tae have become special friends. Thanks also to Alankrita, Jason, Katherine, Brian, and John.

Finally, but not least importantly, I want to thank my daughters Katie and Alice. You two have been incredibly patient with a father who often could not give his full attention. I appreciate your love, support, and tolerance through these difficult four years. As you continue to grow into beautiful young women and wonderful human beings, know that you will always take my love and blessings with you.

July 24, 2012

ABSTRACT

ANTECEDENTS AND OUTCOMES ASSOCIATED WITH THE INDIVIDUAL STRESS RESPONSE

Matthew Blake Hargrove, PhD

The University of Texas at Arlington, 2012

Supervising Professor: James Campbell Quick

This dissertation explores the antecedents and outcomes associated with the individual stress response. It begins with an extensive literature review of three conceptualizations of stress in organizations. Next, the construct psychological capital is explored as a potential moderator of the stressor-stress response relationship. A review of the psychological capital literature is presented including the potential and limitations of current interventions designed to develop psychological capital. A synthetic model for organizational stress is developed and presented. Hypotheses are formulated based on this model. In order to test hypotheses, two tools are developed. First, Psychological Capital Training (PCT), a multimodal intervention designed to help individuals develop psychological capital, is created using best practices from the field of stress prevention

intervention. PCT is then tested in the field using a randomized experiment with pretest and post test. Second, a scale (Self-Report Stress Response Questionnaire, SRSRQ11), designed to measure positive and negative stress response (eustress and distress), is developed and validated in three separate studies. Following validation, the SRSRQ11 is used to test hypotheses. Results of hypotheses testing are presented. This study found evidence to support that hindrance stressors are predictors of cognitive distress, that cognitive eustress and distress predict positive and negative changes in well being, and that cognitive distress predicts adverse changes in health. Findings and limitations of the study are discussed. Future implications of this study on the literature and on the profession are presented.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	iv
ABSTRACT.....	vii
LIST OF ILLUSTRATIONS.....	xv
LIST OF TABLES.....	xvi
Chapter	Page
1. INTRODUCTION	1
1.1 Theoretical Background.....	1
1.2 Definition of the Problems.....	6
1.3 Organization of the Study.....	8
2. LITERATURE REVIEW	10
2.1 Theories of Organizational Stress.....	10
2.1.1 Stressors.....	14
2.1.1.1 Taxonomic Approach to Stressors.....	15
2.1.1.2 Challenge Hindrance Framework.....	21
2.1.2 Stress Response.....	25
2.1.3 Eustress and Distress.....	27
2.1.4 Individual Outcomes Associated with Stress.....	28
2.1.4.1 Performance.....	28
2.1.4.2 Well-Being.....	30

2.1.4.3 Health	31
2.2 Psychological Capital.....	33
2.2.1 Foundations of the Theory	33
2.2.2 Four Strengths: the First-order Constructs.....	34
2.2.2.1 Hope.....	34
2.2.2.2 Optimism.....	35
2.2.2.3 Self-Efficacy	35
2.2.2.4 Resilience	36
2.2.3 Summary of Empirical Findings Related to PsyCap	37
2.2.3.1 PsyCap and Performance	38
2.2.3.2 PsyCap and Well-Being.....	39
2.2.4 Developing Psychological Capital.....	40
2.2.4.1 Developing Hope	41
2.2.4.2 Developing Optimism.....	41
2.2.4.3 Developing Self-Efficacy.....	42
2.2.4.4 Developing Resilience	43
2.2.5 Psychological Capital Intervention	43
2.3 Stress and Psychological Capital	46
2.3.1 Stress and the Four Strengths.....	46
2.3.2 Stress and PsyCap	48
3. MODEL DEVELOPMENT AND HYPOTHESES.....	50
3.1 Synthetic Model of Organizational Stress	50

3.2 Stressors and the Stress Response.....	52
3.2.1 Challenge Stressors and Eustress.....	52
3.2.2 Hindrance Stressors and Distress.....	53
3.3 Developing Psychological Capital through Intervention.....	54
3.4 Psychological Capital as a Moderator of the Stress Response	56
3.4.1 Secondary Stress Intervention and Prevention	56
3.4.2 Psychological Capital as an Enhancer of the Challenge Stressor-Eustress Relationship.....	56
3.4.3 Psychological Capital as an Ameliorator of the Hindrance Stressor-Distress Relationship	58
3.5 Outcomes Associated with Eustress and Distress.....	59
3.5.1 Stress Response and Performance	59
3.5.2 Stress Response and Well-Being.....	60
3.5.3 Stress Response and Health	61
4. METHOD	63
4.1 Sample.....	63
4.2 Experimental Design.....	64
4.2.1 Randomized Field Experiment with Control.....	64
4.3 Study Procedures	65
4.3.1 Pretest.....	66
4.3.2 Psychological Capital Training.....	67
4.3.3 Post Tests	70
4.4 Measures	71

4.4.1 Independent Variables	71
4.4.1.1 Challenge Stressors.....	71
4.4.1.2 Hindrance Stressors	72
4.4.2 Dependent and Moderating Variable - Psychological Capital	72
4.4.3 Dependent and Independent Variables - Eustress and Distress.....	74
4.4.3.1 Scale Development Study.....	74
4.4.3.1.1 Step 1 - Conceptual Definition of Eustress and Distress.....	75
4.4.3.1.2 Step 2 - Generate Items.....	78
4.4.3.1.3 Step 3 - Assess Content Validity	83
4.4.3.1.4 Step 4 - Collect Data and Refine Measures	85
4.4.3.1.5 Step 5 - Specify Nomological Network and Test Hypothesized Relationships.....	85
4.4.4 Dependent Variables	86
4.4.4.1 Performance	86
4.4.4.2 Well-Being.....	86
4.4.4.3 Health.....	87
4.4.5 Demographic Variables	90
5. RESULTS	91
5.1 Scale Development Studies.....	91
5.1.1 Item Generation	91
5.1.2 Content Validity Studies	92

5.1.2.1 Content Validity Study 1	92
5.1.2.2 Content Validity Study 2	96
5.1.2.3 Content Validity Analysis.....	97
5.1.3 Scale Validity Study 3	97
5.1.3.1 Exploratory Factor Analysis	99
5.1.3.2 Factor Structure and Final Item Selection	102
5.1.3.3 Reliability of the SRSRQ11	103
5.1.3.4 Convergent and Discriminant Validity	103
5.2 Hypotheses Testing.....	106
5.2.1 Sample.....	107
5.2.2 Descriptive Statistics and Correlations	108
5.2.3 Challenge Stressors and Positive Stress.....	108
5.2.4 Hindrance Stressors and Negative Stress.....	110
5.2.5 Effectiveness of Psychological Capital Training.....	111
5.2.6 Psychological Capital as a Moderator of the Relationship between Challenge Stressors and Eustress	112
5.2.7 Psychological Capital as a Moderator of the Relationship between Hindrance Stressors and Distress	113
5.2.8 Stress Response and Individual Outcomes	115
5.2.8.1 Performance	115
5.2.8.2 Well-Being.....	116
5.2.8.3 Health.....	117
6. DISCUSSION	121

6.1 Interpretation of Results.....	122
6.1.1 Psychological Capital as a Moderator.....	122
6.1.2 Psychological Capital Training.....	123
6.1.3 Self Report Stress Response Questionnaire.....	124
6.1.4 Synthetic Stress Response Model	125
6.2 Contribution	127
6.2.1 Contributions to the Literature.....	128
6.2.2 Contributions to the Profession of Management	130
6.3 Limitations of this Study.....	131
6.4 Opportunities for Future Research.....	133
6.5 Conclusion	135
REFERENCES	137
BIOGRAPHICAL INFORMATION.....	151

LIST OF ILLUSTRATIONS

Figure	Page
2.1 Transactional Model (TM).....	11
2.2 Theory of Preventive Stress Management (TPSM).....	12
2.3 Challenge Hindrance Framework (CHF).....	12
3.1 Synthetic Model of Organizational Stress	51
4.1 Steps for Scale Development.....	75
5.1 Scree Plot for 48 Item EFA.....	100

LIST OF TABLES

Table	Page
2.1 Taxonomy of Stressors	19
4.1 Primary Study Procedure	66
5.1 Content Validity Study Results, Positive Stress Response Items	94
5.2 Content Validity Study Results, Negative Stress Response Items	95
5.3 48 Item EFA Initial Results	99
5.4 Rotated Factor Matrix	101
5.5 SRSRQ11 Items	103
5.6 Scale Descriptive Statistics, Correlations, and Scale Reliabilities	105
5.7 Hypotheses Summary	107
5.8 Descriptive Statistics, Correlations, and Scale Reliabilities	109
5.9 Regression Analysis, Hypothesis 1	110
5.10 Regression Analysis, Hypothesis 2	111
5.11 Between Group Differences, Hypothesis 3	112
5.12 Regression Analysis, Hypothesis 4	114
5.13 Regression Analysis, Hypothesis 5	114
5.14 Regression Analysis, Hypotheses 6a and 7a	115
5.15 Regression Analysis, Hypotheses 6b and 7b	116
5.16 Regression Analysis, Hypotheses 6c and 7c	119

5.17 Regression Analysis, Hypotheses 6c and 7c.....119

CHAPTER 1

INTRODUCTION

1.1 Theoretical Background

Stress within organizations matters. Stress is a key factor predicting individual and thus organizational performance (Quick, Quick, & Nelson, 1998). Organizations depend upon healthy, happy, and productive employees to attain organizational goals (Quick & Quick, 2004; Wright & Quick, 2009). Managers who ignore the impact of stress upon their employees fail in their duty as the stewards of their firms' best interests and fail as the leaders of the employees who depend upon them (Quick, Wright, Adkins, Nelson, & Quick, 2013). This dissertation seeks to increase the understanding of the antecedents and outcomes associated with the individual stress response. The first step towards this goal is to briefly summarize four streams of literature which frame this study.

Stress, within the context of workplaces, known as occupational stress, has been studied for more than half a century (Kahn, 1964). It is well understood that individuals, whatever the nature of their work, will experience demands, stimuli, or stressors, that have the potential to cause a stress response. *Stressors* are physical and psychological stimuli that produce a stress response (Quick J. C., Quick, Nelson, & Hurrell, 1997). The individual *stress response* is the generalized psycho-physiological change experienced by individuals exposed to a stressor or stressors (Quick, et al., 1997). Stress responses can

be either positive or negative for the individual. For the past three decades, organizational researchers have both theoretically and empirically explored the nature of stressors and the importance of the individual stress response (Cooper, 1983; Lazarus & Folkman, 1984; Folkman & Lazarus, 1985; Quick, et al., 1997; Cooper, 1998).

The term *stressors* includes a wide variety of stimuli originating from many different sources. One significant body of research has sought to identify and categorize these stressors. Many stress inducing stimuli in the workplace are of an anticipated, recurring nature (Quick, et al., 1998). For example, managers at a FedEx depot must deal with huge numbers of packages on a daily basis; these packages must be sorted and distributed under ever-present, unforgiving, time deadlines. For FedEx managers then the stressful stimuli caused by periodic problems due to equipment, procedures, or employees are all part of a "normal" workday. Similarly, office workers may be faced with a variety of stressors on a daily basis, e.g. computer problems, interpersonal conflicts, or difficult work assignments. These examples illustrate that stressors are an ubiquitous and accepted part of individual's lives within organizations. Thus stressors can be conceptualized as regular components of an occupational environment (Quick, et al., 2013) In other words, stressors are part of the typical ecosystem in which individuals spend their work lives. Though work-based stressors are an expected and ubiquitous phenomenon, this does not imply that all stressors are inevitable or that stressors do not vary. Though some stressors, like the FedEx countdown clock, are regular and anticipated, others are unexpected and difficult to predict. Not only are some stressors surprising, but stressors also vary in magnitude - a verbal disagreement between two

workers is one thing, but a fist-fight between two workers is quite another. Thus, stressors can vary both in terms of predictability and magnitude. Not all of this variance is random. Individuals and organizations are not helpless with regard to dealing with organizational stress. An entire body of empirical literature has demonstrated that stress can be prevented using a variety of individual and organizational interventions (Lamontagne, Keegel, Louie, Ostry, & Landsbergis, 2007; Richardson & Rothstein, 2008).

Consistent with three key theories of organizational stress, variance in stressors can produce variance in the stress response (Lazarus & Folkman, 1984; Quick, et al., 1997; Cavanaugh, et al., 2000). Some stimuli produce no response (Lazarus & Folkman, 1984), some stimuli produce positive responses (Lazarus & Folkman, 1984; Quick, et al., 1997; Cavanaugh, et al., 2000; Nelson & Simmons, 2011) and some can produce negative responses (Lazarus & Folkman, 1984; Quick, et al., 1997; Cavanaugh, Boswell, Roehling, & Boudreau, 2000). Both individual and psychosocial factors are capable of modifying the stress response (Karasek & Theorell, 1990). Specifically, different individuals vary in their resources for responding to the stress and different organizations provide varying environments in which the stressors occur.

A variety of individual characteristics have been shown to moderate the stressor/stress response relationship. Some of these individual characteristics include general mental ability, personality factors (Ebstrup, Eplöv, Pisinger, & Jørgensen, 2011), and demographic factors such as age and sex (cf. Quick, et al., 1997). Other individual characteristics affecting the stressor/stress response relationship include an individual's

sense of hope (Snyder, Irving, & Anderson, 1991; Snyder, et al., 2000; Resick, 2007), optimism (Carver & Scheier, 2002; O'Connor & Cassidy, 2007), self-efficacy (Bandura, 1997; Klein-Hessling, Lohaus, & Ball, 2005; Ebstrup, et al., 2011), and resilience (Coutu, 2002; Gist & Taylor, 2008; Irmansyah, Dharmono, Maramis, & Minas, 2010).

Taken together, hope, optimism, self-efficacy and resilience comprise the construct of psychological capital (Luthans, Luthans, & Luthans, 2004; Luthans & Youssef, 2004). Significant empirical evidence is now available that psychological capital is a robust construct (Luthans, Avolio, Avey, & Norman, 2007), and meta-analytic results indicate that psychological capital is a useful predictor of a variety of variables within the field of organizational behavior (Avey, Reichard, Luthans, & Mhatre, 2011). As would be expected given its constituent dimensions, psychological capital is a promising variable in the field of occupational stress. Preliminary empirical results indicate that psychological capital is related to perceptions of organizational stress (Avey, Luthans, & Jenson, 2009).

An important factor for the proper understanding of the psychological capital construct is that it is a state-like and developable characteristic (Luthans & Youssef, 2004; Luthans, Avey, Avolio, Norman, & Combs, 2006; Luthans, Avey, & Patera, 2008). Two empirical studies have provided evidence that organizational interventions are effective at improving psychological capital among employees who receive training interventions (Luthans, Avey, & Patera, 2008; Demerouti, van Eeuwijk, Snelder, & Wild, 2011). This evidence is important because it suggests that employers who offer effective training interventions have the potential to improve individual and organizational

outcomes by building the psychological strengths of their employees. Perhaps most intriguing, the training programs used to date do not take full advantage of the best practices in the field of occupational stress intervention.

Stress in organizations is studied because it matters. Leaders are challenged to address organizational stress in order to create organizations in which employees can be healthy, happy, and productive (Quick & Quick, 2004). These three outcomes have been linked to organizational stress for decades. Organizational stress was identified as a mental and physical health issue during the late 1970's (Karasek, 1979; Quick & Quick, 1979). Since that time, hundreds of studies have been published regarding the impact of organizational stress on employees. The positive stress response has been positively related to employee performance (Nelson & Simmons, 2011), and negative stress response has been associated with poor performance (LePine, Podsakoff, & LePine, 2005). Stress is also a significant predictor of individual well-being; happiness and other positive emotions are perhaps the most common measures used to operationalize the positive stress response (Folkman & Lazarus, 1985). The broad literature supports the connection between individual stress and individual outcomes.

So, what do we know? The preceding paragraphs introduce four lines of research representative of the current state of knowledge: (1) people working in organizations face a variety of stimuli which produce a stress response, (2) the individual stress response depends in part on the nature of the stressor and on individual characteristics, (3) psychological capital has a demonstrated theoretical and empirical potential to be a significant individual characteristic with regard to the stress response, and (4) stress in

organizations affects individual outcomes. In the following section of this introductory chapter, gaps in the state of knowledge will be presented.

1.2 Definition of the Problems

As previously mentioned, this dissertation seeks to increase the understanding of the antecedents and outcomes associated with the individual stress response. In order to accomplish this goal, some unresolved questions must first be understood. In this section, four problems which challenge scholars of organizational stress are presented.

The first problem involves a measurement issue. Although the concepts of positive stress (eustress) and negative stress (distress) have existed in the parlance of the literature for many years (Selye, 1975), positive stress has received only a small fraction of the total empirical attention (Nelson & Simmons, 2011; Quick, et al., 2013). As of this writing, there are no widely accepted self-report survey measures for eustress. Similarly, though the negative effects of stress have received a great deal of attention, distress itself has not been psychometrically measured. Commonly used operationalizations of distress - e. g., burnout, strain, and negative affect - present issues of content validity. Thus, one goal of this research is to address this measurement problem by creating a useful self-report scale for both eustress and distress.

The second problem to be addressed by this study concerns interventions designed to develop psychological capital. Though several empirical studies have demonstrated that psychological capital is malleable and can be developed via intervention efforts (Luthans, et al., 2008; Demerouti, et al., 2011), none have combined the proper conceptualization of psychological capital with the full range of best

intervention practices found in the occupational stress literature (Lamontagne et al, 2007; Richardson & Rothstein, 2008). This study seeks to address this problem by adapting a state of the art stress intervention program to create a more effective form of psychological capital training.

The third problem addressed by this study concerns the interaction between psychological capital and stressors. Cavanaugh et al. (2000) introduced a conceptual framework in which stressors were categorized as challenge-related or hindrance-related. Though an increasing body of literature supports this categorization (LePine, et al., 2005; Podsakoff, LePine, & LePine, 2007), it is not clearly understood how this categorization of stressors relates to individual psychological strengths. Specifically, the relationship between psychological capital and challenge and hindrance stressors has not been theoretically or empirically examined. Avey et al. (2009) specifically encouraged this examination; they suggested that a better understanding of the relationship between psychological capital and organizational stress requires a more nuanced operationalization of stressors. The initial empirical investigation of psychological capital and stress employed an imprecise unidimensional operationalization of positive and negative stress. This study seeks to improve understanding of the relationship between psychological capital and stressors and stress response by employing a more nuanced theoretical framework and utilizing more precise operational measures. In this regard, this study answers the call for research, improves measures of key stress constructs, and explores potential interactive relationships.

The measures created in this study to operationalize eustress and distress will also be useful with regard to the investigation of individual outcomes. Performance, well-being, and physical health are three key individual outcomes of interest to organizational scholars. Because there are no existing accepted measures for eustress and distress, most studies in the field use proxy measures (e.g. positive affect for eustress, and burnout or strain for distress). These proxy measures lack the construct validity of a scale developed specifically for the purpose of measuring stress response. Because stress response has been operationalized using proxies, the extant empirical conclusions regarding the relationship between stress response and outcomes may be of limited value. In other words, while we know that *burnout* and *strain* are negatively related to performance it is often not realized that burnout and strain are not *distress*, but rather they are outcomes of distress. Similarly, *positive coping strategies* are associated with performance, and while *positive coping strategies* are similar to eustress, they are not identical to *this concept*. This study tests the relationships between eustress, distress, and three important individual outcomes previously associated with stress.

1.3 Organization of the Study

The purpose of this dissertation is fivefold: (1) to develop an effective self-report measure of eustress, the positive stress response, (2) to develop an effective self-report measure of distress, the negative response, (3) to develop an effective organizational training tool, psychological capital training, which will help individuals build strengths, (4) to explore the interaction between individual strengths and stressors with regard to the stressor/stress response relationship, and (5) to test the relationships among positive and

negative stress response and the individual outcomes of performance, well-being, and health. The study contains six chapters. Chapter 2 is divided into three sections. The first section reviews three key theoretical frameworks for organizational stress and systematically presents the key concepts offered by each of the three theories. The second section provides an overview of the theory of psychological capital. This section discusses the constituent strengths of psychological capital in some detail and presents the results of the empirical investigations completed concerning this construct. The third section of Chapter 2 discusses the theoretical relationship between the psychological capital construct and individual stress. Chapter 3 presents the synthetic theoretical model used to frame this research. In addition, Chapter 3 formally specifies the hypotheses to be tested by this study. Chapter 4 contains the methods to be employed in this research. Treatment and measurement procedures are specified. Chapter 5 contains the hypotheses tests and the analysis of the data gathered in this research project. The final chapter is a thorough discussion of the findings of the research. Limitations of the research are presented as well as suggestions of opportunities for future studies.

CHAPTER 2

LITERATURE REVIEW

2.1 Theories of Organizational Stress

Stress, and the way individuals respond to it, has been the subject of scientific inquiry for almost a century (Cannon, 1915/1929). For the past 50 years, stress within the context of organizations has been investigated theoretically and empirically (Quick, et al., 1997; Cooper, 1998). Stress is a broad and ambiguous concept rather than a carefully defined scientific term (Kahn, 1987). Quick, et al. (1997, p.2) describe stress in the organizational context as an "overarching rubric for the domain concerned with how individuals adjust to their environments." Within this broad domain, organizational scholars have sought to investigate the sources of organizational stress, the mechanisms by which individuals adjust to these sources, and the various effects of individual responses. Cooper (1998) identified more than thirteen discrete theories of organizational stress, and new theories continue to be developed. As would be expected, theories of organizational stress have both significant commonalities and significant differences.

There are three conceptualizations of stress within organizations of particular relevance to this research. The first is the transactional model of stress and coping (TM) offered by Lazarus and Folkman (1984; Folkman & Lazarus, 1985). Within the TM (see Figure 2.1), stimuli exist and these stimuli are iteratively appraised by an individual. The first iteration, termed primary appraisal, results in the stimuli being categorized as a

threat or a non-threat. If a stimulus is perceived as a non-threat, no stress results, and no response is perceptible. If a

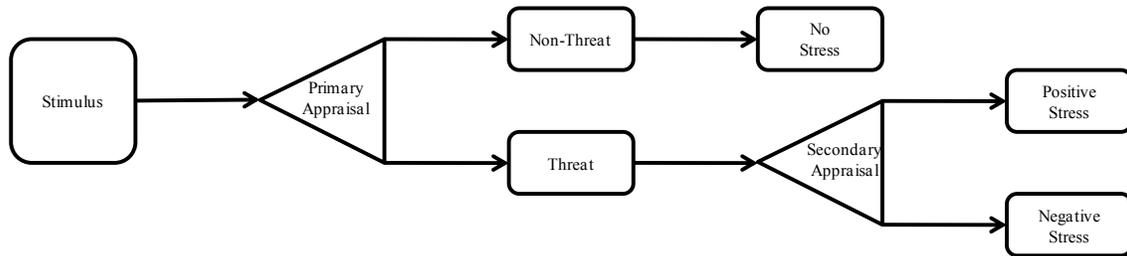


Figure 2.1 Transactional Model (TM)

stimulus is perceived as a threat, the individual appraises it again. During this secondary appraisal, an individual assesses both the nature of the threat and the resources available for coping with the threat. If an individual perceives that there are resources available to cope with a threat, then positive stress results. If an individual perceives that a threat overwhelms the coping resources available, negative stress results.

The second theoretical framework for organizational stress of special relevance to this research is the theory of preventive stress management (TPSM) introduced by Jim and Jonathan Quick (Quick & Quick, 1979) and expanded by their many collaborators (c.f. Hargrove, Quick, Nelson, & Quick 2011). As the name of the theory implies, the TPSM attempts to explain both how stress occurs within organizations and how stress can be prevented (Quick, et al., 1997). The TPSM frames organizational stress as a process beginning with the existence of stimuli which places demands upon individuals (see Figure 2.2). These demands, termed stressors, have no valence, i.e. they are neither negative nor positive in themselves. Depending upon the nature of the stressor and the resources available to the individual, a stress response ensues. A stress response can be

either positive or negative. A positive stress response results in a state of eustress; a negative stress response results in a

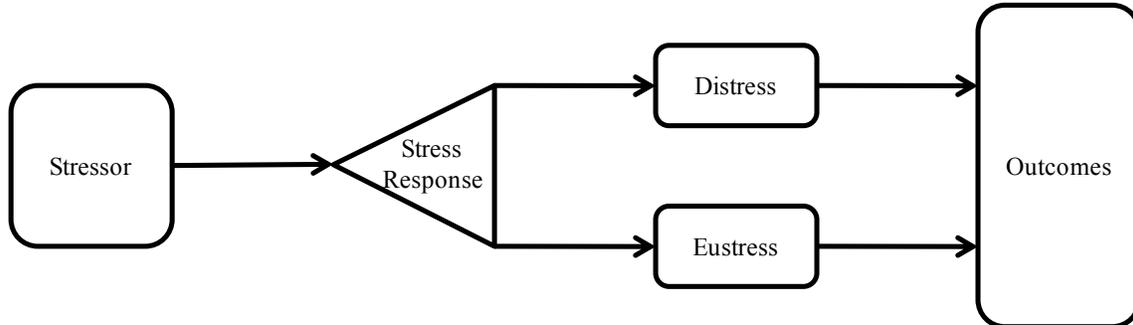


Figure 2.2 Theory of Preventive Stress Management (TPSM)

state of distress. The state of eustress is associated with positive outcomes and the state of distress is associated with negative outcomes.

The final framework for understanding organizational stress relevant to this research is the challenge-hindrane framework (CHF) as introduced by Cavanaugh et al. (2000). Unlike the previous comprehensive models of organizational stress, the CHF does not offer a broad process model of organizational stress; rather, it is an attempt to explain why some self-reported work stress did not predict negative work outcomes (See Figure 2.3).

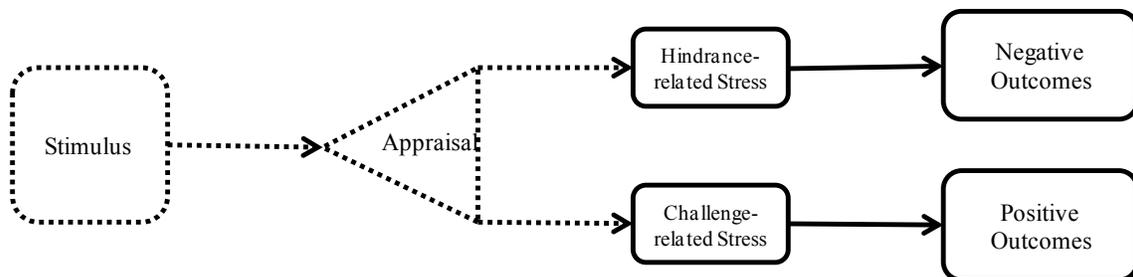


Figure 2.3 Challenge-Hindrane Framework (CHF)

The CHF categorizes stress as either challenge-related or hindrance-related. *Challenge-related self-reported stress* are stressors which lead to positive outcomes, while *hindrance-related self-reported stress* are stressors that lead to negative outcomes. As a relatively new theoretical framework, the definitions of the central terms continue to evolve. Perhaps the most rigorous theoretical definitions of the framework's central terms have been accomplished by Podsakoff (2007). In an attempt to harmonize the challenge stressor framework with the transactional model, Podsakoff redefines *challenge stressors* as workplace demands "appraised as promoting accomplishment of job tasks and the personal development of the individual" (2007, p. 87). Podsakoff continues by redefining *hindrance stressors* as workplace demands "appraised as barriers or obstacles to the accomplishment of job tasks and the personal development of the individual" (2007, p. 88). A growing body of empirical investigations provides evidentiary support for this conceptual framework (Cavanaugh, et al., 2000; LePine, et al., 2005; Boswell, Olson-Buchanan, & LePine, 2004; LePine, LePine & Jackson, 2004; Haar, 2006; Rodell & Judge, 2009; LePine, LePine, & Saul, 2007; Podsakoff, 2007; Podsakoff, et al., 2007; Pearsall, Ellis, & Stein, 2009; Culbertson, Huffman, & Alden-Andersen, 2010; Webster, Beehr, & Christiansen, 2010; Webster, Beehr, & Love, 2011). Despite its more narrow focus, the CHF concept makes a significant contribution to the understanding of organizational stressors and outcomes associated with stress.

Though all three conceptualizations of stress offer unique insights into how individuals adapt to stressors in the workplace, they also overlap significantly. First, all three models view stressors as the triggers to responses and outcomes. In the TM the

stress response depends upon appraisal. In the TPSM, the stress response is dependent upon the nature of the stressors as moderated by individual and organizational factors. In the CHF, outcomes are related to the nature of the stressors. Second, all three conceptualizations recognize that outcomes are dependent upon positive and negative stress response. In all three conceptualizations, triggers have no particular valence until an individual responds. In other words, none of these theories hold that all stressors need be negative.

2.1.1 Stressors

All models of organizational stress recognize that individuals experience a variety of stimuli from a variety of sources which fall under the general rubric of stressors; various authors term these stimuli as situations, demands, events, stress domains, stress factors, etc. This paper defines *stressors* as those demands that have the potential to result in an adaptive response. This definition is consistent with that of the TPSM (Quick, et al., 1997, p. 3) and is directly analogous to *threats* within the TM. Consistent with both the TM and the TPSM, *stressors* have no valence. Stressors should be understood to be both objective and subjective. In other words, stressors are both objectively measurable and dependent upon perception. For example, violence in the workplace is a recognized organizational stressor. Both the intentional breaking of a windshield and the intentional breaking of a leg could be instances of workplace violence. Objectively, these two examples are different, i.e. broken bones are personal injuries and broken windshields are property damage. How these examples are perceived is dependent upon a variety of individual and contextual factors. A police officer in Iraq accustomed to suicide bombings resulting in deaths may not perceive a broken

windshield as serious workplace violence. A nurse working in a clinic in a small town in Iowa may perceive the windshield as a major event.

2.1.1.1 Taxonomic Approach to Stressors

Many organizational scholars have attempted to identify and categorize stressors. For example, Kahn (1964) identified a group of role-based stressors including role conflict and role ambiguity. Cooper (1983) categorized stressors into six major sources: job factors, role factors, career development factors, relationship factors, structural and climate factors, and home to work factors. Each of these sources was then divided into sub-categories.

Following the taxonomy offered in the TPSM (c.f. Quick, et al. 1997, p. 22), stressors can be characterized as physical, interpersonal, role, or task. *Physical stressors* are those conditions that affect the senses and exist in the work environment. They include such stimuli as light, noise, vibration, smell, temperature, etc. (Quick, et al., 1997). For example, an air conditioning vent blowing cold air on a worker in a cubicle could stimulate a stress response as could the hot Texas sun beating down on a construction worker pouring molten asphalt on a summer day. *Interpersonal stressors* arise from relationship demands (Quick & Quick, 1979). Relationship demands exist both at home and at work. At work, demands originate from customers, vendors, coworkers, subordinates, and superiors. An individual who believes that his boss "hates his guts" would be experiencing a significant interpersonal stressor. *Task stressors* are those stimuli directly related to the quality and quantity of work performed. For example, the life saving work which transplant surgeons perform presents a significantly different

task stressor than a roofer responsible for the proper nailing of a shingle. Task stressors also include the feedback and appraisals that individuals receive from their supervisors regarding their performance. A manager who places an employee on a performance improvement plan should expect that disciplinary action to stimulate the employee concern. *Job uncertainty* is another significant source of task stressors. Individuals employed in organizations in which layoffs are imminent are likely to experience significant levels of this category of stressor. *Role stressors* arise from role-based expectations placed upon an individual within an organization (Quick & Quick, 1979; Quick & Quick, 1984). In general, role stressors are more significant if role expectations are confusing, ambiguous, or conflicting. For example, a new employee who is asked to perform a complex job for which she is poorly prepared and for which she has received no training, will likely experience a significant level of role stress.

Other scholars have used literature reviews and statistical modeling techniques to identify sources of organizational stress (Podsakoff, 2007; Vanroelen, Levecque, Moors, Gadeyne, & Louckx, 2009; Nelson & Simmons, 2003). In his comprehensive review of the occupational stress literature, Podsakoff (cf. 2007, p. 84) identified the following eleven dimensions of workplace stress: role ambiguity, role conflict, workload or role demands, resource inadequacies, work pace or time pressure, organizational politics, administrative hassles or red tape, interpersonal conflict, job complexity, job responsibility, and job insecurity. Using the CHF, Podsakoff (2007) categorized four of these dimensions as challenge stressors and seven of them as hindrance stressors. Psychometric evidence produced in the same study supported the content, internal,

discriminant, and predictive validity of these eleven dimensions and two categories (Podsakoff, 2007). Using the theoretical framework provided by the demand-control-support model of organizational stress, Vanroelen, et al. (2009) performed a statistical analysis of the work stressors faced by more than 11,000 Belgian (Flemish) workers. Using data collected from this very large sample, they modeled a variety of stressor taxonomies. According to their analysis, the best fit of the data indicated that there were four dimensions: immaterial demands, physical demands, job control, and quality of social relationships (Vanroelen, et al., 2009). In addition, this study found that job insecurity was an additional significant source of stress in organizations. Nelson and Simmons (2003) identified five categories of individual stressors: role demands, interpersonal demands, physical demands, workplace policies, and job conditions; the authors identified a variety of stressors grouped inside these five categories.

In their upcoming elaboration of the TPSM, Quick et al. (2013) conceptualize workplace stressors as environmental factors. They offer three environments in which stressors occur: the physical, the functional, and the contextual. Obvious physical environmental stressors are such things as sounds, temperature, lighting, and odors. Other stressors originating in the physical environment include space, design, aesthetics, and ergonomics. Stressors in the functional environment include occupational stressors resulting from the nature of the work that people do. For example, role overload, role ambiguity, person-job fit, and occupational category are all potential stressors originating from the functional environment. Stressors from the contextual environment are those coming from the socio-psychological factors such as culture, climate, and interpersonal

relationships. Two such stressors included in this environmental dimension are justice climate and culture of diversity and/or discrimination.

Table 2.1 summarizes the six approaches to organizational stressors described above. There are six columns in Table 2.1. The column on the far left lists all the types of organizational stressors identified in this literature review. Each of the seven columns to the right contains the citation associated with a specific taxonomy of stressors. The bottom row of Table 2.1 lists the grouping categories used for the various types of stressors in each taxonomy. The first four types of stressors listed in Table 2.1 are the types categorized as challenge stressors by Podsakoff (2007). As can be seen, "Work Load" is identified by all six other research teams as a stressor, while "Work Pace," "Job Complexity," and "Job Responsibility" are identified by one, four, and three additional teams respectively. The next seven types of stressors listed in Table 2.1 are the types categorized as hindrance stressors by Podsakoff (2007).

Four other research teams identify "Role Ambiguity," "Organizational Politics," and "Job Insecurity" as workplace stressors. Four other research teams identify "Role Conflict" and "Interpersonal Conflict." One other research team concurs with "Red Tape." Podsakoff (2007) alone among these authors identifies "Resource Inadequacies" as a workplace stressor. The remaining nine types of stressors found in Table 2.1 are not identified by Podsakoff (2007). Of these remaining types of stressors, "Physical Stressors" are identified by five teams, and "Work Schedules," "Extra-organizational

Table 2.1 Taxonomy of Stressors

TYPES OF STRESSORS	Cooper (1983)	Quick et al. (1997)	Cavanaugh et al. (2000)	Nelson & Simmons (2003)
Work Load	work overload work underload	work overload	number of projects/assignments	work overload
Work Pace			volume of work per allotted time time pressures	
Job Complexity		routine jobs job category		routine jobs skill discretion
Job Responsibility	over promotion		scope of responsibility amount of responsibility	
Role Ambiguity	role ambiguity	role ambiguity	clear understanding of job expectations	role ambiguity
Role Conflict	role conflict boundary issues	interrole conflict intra-role conflict interactive org. demands boundary spanning		role conflict
Organizational Politics	office politics nature of relationships	social density team pressures	organizational politics	team pressures
Resource Inadequacies				
Red Tape			red tape	
Interpersonal Conflict		abrasive personalities		sexual harassment
Job Insecurity	job insecurity fear of job loss	job future ambiguity	lack of job security	downsizing
Physical Stressors	poor physical working conditions physical danger	indoor climate and air quality temperature illumination and other rays noise and vibrations office designs		temperature, indoor climate, air quality illumination noise office design
Work Schedule	shift work		time spent at work	
Social Support	colleague support boss support subordinate support			
Career Track	under promotion blocked ambition thwarted ambition		degree to which career is stalled	promotion status
Fit	P-E fit status incongruency	person-role conflict status incongruity		
Extra-organizational Demands	dual career stress	work to home demands		work-home
Justice	ineffective consultation insufficient participation behavioral restrictions			trust
Emotional Demands				
Other	job satisfaction	leadership style diversity		leadership diversity wages & benefits
CATEGORIES	JOB ROLE CAREER DEVELOPMENT RELATIONSHIPS ORG. & CLIMATE WORK TO FAMILY	PHYSICAL ROLE TASK INTERPERSONAL	CHALLENGE HINDRANCE	ROLE DEMANDS INTERPERSONAL DEMANDS PHYSICAL DEMANDS WORKPLACE POLICIES JOB CONDITIONS

Table 2.1 - *Continued*

TYPES OF STRESSORS	Podsakoff (2007)	Vanroelen et al. (2009)	Quick et al. (2013)
Work Load	workload	quantitative demands	work overload
Work Pace	work pace		
Job Complexity	job complexity	task variation	information overload unfinished work
Job Responsibility	job responsibility	job autonomy	role overload
Role Ambiguity	role ambiguity		role ambiguity
Role Conflict	role conflict		role conflict
Organizational Politics	organizational politics		competition and teamwork
Resource Inadequacies	resource inadequacies		
Red Tape	administrative hassles/red tape		
Interpersonal Conflict	interpersonal conflict	negative interactions/bullying	hostility and aggression
Job Insecurity	job insecurity	job insecurity	
Physical Stressors		physical demands repetitive movements	environmental conditions space, design, and aesthetics ergonomics - human to machine interface
Work Schedule		overtime work sudden schedule changes type of work schedule	telework telecommuting timing of work periods
Social Support		positive interactions/support	leadership support cooperation
Career Track			task - career path & transitions role insufficiency
Fit			task - occupation category and P-J Fit
Extra-organizational Demands			extra-organizational stressors justice
Justice			
Emotional Demands		emotional demands	emotional work
Other			leadership clarity leadership communication diversity and discrimination
CATEGORIES	CHALLENGE HINDRANCE	IMMATERIAL PHYSICAL JOB CONTROL QUALITY RELATIONSHIPS JOB INSECURITY	PHYSICAL FUNCTIONAL CONTEXTUAL

Demands," and "Career Track: are identified by four research teams. "Social Support," "Fit," and "Extra-organizational Demands" are identified by three others. It is possible that "Work Schedules," "Social Support," "Career Track," and "Fit" are covered by Podsakoff's (2007) taxonomy. For example, the content of "Work Schedules" might be closely related to "Work Load" or "Work Pace"; similarly, the content of "Career Track" might be closely related to "Job Insecurity." "Physical Stressors" and "Extra-organizational Demands" are not contemplated in Podsakoff (2007), which suggests an opportunity to improve that taxonomy.

2.1.1.2 Challenge Hindrance Framework

The CHF was introduced by Cavanaugh et al. (2000) as an attempt to develop a self-report measure that distinguished between the causes of positive and negative outcomes related to stress. These authors asserted that some stress was positive (challenge-related self-reported stress) and some stress was negative (hindrance-related self reported stress). The definitions of these two types of stress are somewhat tautological and have not received ongoing support in this research stream. For example, Cavanaugh et al. (2000) define hindrance-related self-reported stress as those "stressors...associated with negative work outcomes." Despite some of the shortcomings in the original construct definitions, the CHF has been recognized as a useful theoretical framework and has generated a substantial stream of research in the field of occupational stress.

Like all new theories, the CHF has undergone substantial refinement during the past decade. One important area of improvement has concerned the definitions of the

framework's key constructs. Cavanaugh et al. (2000) used the term *challenge-related self-reported stress* to refer to those stressors which are related with positive outcomes. LePine et al. (2005) used the term *challenge stressors* and defined the term as "obstacles to be overcome in order to learn and achieve" (p. 765). Podsakoff later refines the definition of *challenge stressors* as those stressors "appraised as promoting accomplishment of job tasks and the personal development of the individual" (2007, p. 87). These improved definitions help make the CHF more interpretable in terms of existing theories of stress such as the TM or the TPSM.

Empirical findings have generally provided evidence to support the CHF. In a study among heterogeneous university workers, challenge stressors and hindrance stressors were differently related to outcome variables (Boswell, et al., 2004). Challenge stressors were found to be negatively correlated to job withdrawal, job search, and intention to quit. The same study found hindrance stressors were significantly negatively correlated to loyalty and significantly positively related to job search and intention to quit. Challenge stressors and hindrance stressors appear to have different relationships with motivation to learn; challenge stressors are related positively, and hindrance stressors are related negatively (LePine, et al., 2004). Another study found that challenge stressors were positively related to supervisor support, organizational support, and loyalty, while hindrance stressors were negatively related to the same variables (Haar, 2006). In a study among new product development teams, evidence indicated that challenge stressors improved team performance, while hindrance stressors reduced performance (Chong, Van Eerde, Chai, & Rutte, 2011).

Support for the CHF has not been unequivocal. Several findings call into question the differential outcomes framework. Both challenge stressors and hindrance stressors were positively correlated to psychological strain as operationalized by burnout (Boswell, et al., 2004). Similarly, there is other evidence to support that both challenge and hindrance stressors are positively associated with exhaustion (LePine, et al., 2004). In another study, evidence indicates that certain types of stressors could be simultaneously appraised as both challenge stressors and hindrance stressors suggesting a mediating role for appraisal (Webster, et al., 2011).

Meta-analytic studies have been generally supportive of the differential outcomes hypothesis (LePine, et al., 2005; Podsakoff, et al., 2007). In their first meta-analysis which included more than 82 articles and manuscripts and more than 100 independent samples, LePine et al. (2005) found that challenge stressors had a direct positive effect on performance and that hindrance stressors had a direct negative effect on performance. This study also found indirect effects on performance via strain and motivation. Challenge stressors were negatively correlated with strain and positively associated with motivation; hindrance stressors had the opposite correlations. In this research team's second meta-analysis, which included data from 183 samples, Podsakoff et al. (2007) found evidence that supported the hypotheses that challenge stressors are associated with positive outcomes and hindrance stressors are associated with negative outcomes. The outcome variables tested in this second study included job satisfaction, organizational commitment, turnover intentions, and turnover.

Several recent studies have provided evidence that the relationship between challenge and hindrance stressors is not simple. As previously mentioned, LePine et al. (2005) found that motivation and strain partially mediated the negative relationship between stressors and performance. A set of similar findings suggest that emotion plays a mediating role between stressors and work behaviors (Rodell & Judge, 2009). This study provides evidence that the relationship between challenge stressors and citizenship behaviors is not a simple, direct relationship; challenge stressors have a positive indirect relationship on citizenship behaviors via attentiveness (Rodell & Judge, 2009). The same study provides evidence that anxiety and anger mediated the positive relationship between hindrance stressors and counterproductive behavior. A closely related finding suggests that job satisfaction partially mediates the negative relationship between hindrance stressors and citizenship behaviors (Webster, et al., 2011). Finally, a recent study provides evidence that hindrance related stress mediates the positive relationship between loyalty and leader-member exchange (Culbertson, et al., 2010).

An important unpublished manuscript relevant to the discussion of the CHF is Nathan Podsakoff's (2007) dissertation. In his dissertation, Podsakoff rigorously develops improved scales with which to measure challenge and hindrance stressors. Prior to performing comprehensive psychometric validation studies, Podsakoff reconceptualizes the CHF to include eleven dimensions (four challenge dimensions and seven hindrance dimensions). These dimensions are discussed previously in Section 2.1.1 of this study and can be found as the first eleven rows in Table 2.1.

The CHF has, in general, been supported by published empirical studies to date. Thus, in a little more than ten years after development, the CHF appears to be a fruitful conceptual framework with which to explore occupational stress.

2.1.2 Stress Response

Within the TPSM, stress response is defined as "the generalized, patterned, unconscious mobilization of the body's natural energy resources when confronted with a demand or stressor (Quick, et al., 1997, p. 3). According to this theory, the stress response produces four mind-body changes: (1) a redirection of blood away from the extremities and vegetative organs and towards the brain and large muscle groups, (2) an enabling of the reticular activating system resulting in increased alertness and sensual acuity, (3) a release of glucose and fatty acids into the blood stream to serve as fuel, and (4) the shutting down of the body's restorative and digestive processes. In short, these mind-body changes are the psycho-physiologic preparations for fight or flight as introduced by some of the earliest stress pioneers including Cannon (1915/1929). Within the conceptual framework offered by the TPSM, a healthy stress response is an essential life-enabling evolutionary adaptation. The stress response enables humans to avoid dangers, mitigate physical and psychological damages, and manage in emergency and other critical situations. In other words, these mind-body changes are an adaptive response to the environments in which humans live (Quick, et al., 2013).

Both the TM and the CHF conceptualize the stress response more as a cognitive process than a psycho-physiological one. Lazarus and Folkman (1984, Folkman & Lazarus 1985) argue that stressors are iteratively cognitively appraised. Of particular interest in this research is the secondary appraisal process as described by Lazarus and

Folkman (1984; Folkman & Lazarus, 1985). During secondary appraisal, an individual evaluates two factors. First, the individual assesses the controllability of the threat. Second, the individual evaluates the resources available for coping with the threat. If the threat is manageable and sufficient resources are deployable, the threat results in a positive stress response. If a threat is either out of control or the individual has insufficient coping resources, distress results.

The first factor, controllability of the threat, is dependent upon various predictors. This is closely related to other conceptualizations of stress. For example, Quick et al. (1997) speak of the intensity and duration of a stressor. Intensity refers to the magnitude of the stressor. For example, employees may respond differently to a verbal warning about absenteeism than to a written warning which threatens termination. Duration of a stressor is also important. An employee who is subjected once to verbal abuse once by a supervisor may experience this stressor very differently than an employee who has been subjected repeatedly to the same abuse. The second factor, evaluation of available coping resources, requires individuals to be cognizant of both the internal and external coping resources at their disposal. For example, an employee faced with an abusive co-worker must be able to accurately assess his own internal resources (such as fortitude) and his own external resources (such as supervisor support) to assess whether or not this stressor is manageable. In the CHF, cognitive appraisal is also an important factor. In this conceptual framework, individuals appraise stressors as either challenges or hindrances (Cavanaugh, et al., 2000). This appraisal drives the stress response and the ultimate outcomes.

All three theories of interest concur that individual stress responses vary based upon the stressors experienced and individual factors that can interact with those stressors. All three theories concur that stress responses can be positive or negative.

2.1.3 Eustress and Distress

The TM, the TPSM, and the CHF agree that stressors in organizations do not necessarily lead to negative outcomes. In part, all three theories refer to the seminal work of Hans Selye. Selye (1975) argued that stress need not be distressful, and that stress as an agent (stressors) must be separated from stress as an outcome (positive or negative stress). The TM views both positive stress and negative stress as the conditions arising after the secondary appraisal of a potentially threatening stressor (Lazarus & Folkman, 1984). Positive stress occurs when an individual appraises the threat as manageable due to both the nature of the threat and the coping resources of the individual (Lazarus & Folkman, 1984). Negative stress occurs, on the other hand, when an individual's appraisal indicates that there are insufficient coping resources to manage a threat. In the latter case, the magnitude of the threat exceeds the coping resources available (Lazarus & Folkman, 1984).

The TPSM returns to the terminology used by Selye (1975). The TPSM uses the term *eustress* for *positive stress* and *distress* for *negative stress*. *Eustress* is "defined as the healthy, positive, constructive outcome of stressful events and the stress response" (Quick, et al., 1997, p. 4). The TPSM defines *individual distress* as "the degree of physiological, psychological, and behavioral deviation from an individual's healthy functioning" (Quick, et al., 1997, p. 5).

Finally, within the CHF, positive stress is the state achieved in response to challenge stressors, while negative stress is the state achieved in response to hindrance stressors (Cavanaugh, et al., 2000; LePine et al., 2005). Unlike the TM, both the TPSM and the CHF model positive and negative stress as antecedents to individual outcomes.

Some recent scholarship in the area of positive and negative stress suggests a holistic conceptualization for the two stress responses. In this model, positive stress is indicated by hope, positive affect, vigor, meaningfulness, manageability, satisfaction, and commitment, while negative stress is indicated by anger/hostility, job alienation, frustration, negative affect, burnout and anxiety (Nelson & Simmons, 2011). In this innovative conceptual model, individuals experiencing positive stress *savor* stressors, while individuals experiencing negative stress *cope* with stressors (Nelson & Simmons, 2011). Similar to previous conceptualizations, eustress and distress have different outcomes on such variables as work-performance, mental health, and physical health.

2.1.4 Individual Outcomes Associated with Stress

2.1.4.1 Performance

Both eustress and distress have a strong theoretical and empirical relationship with individual performance. In general, eustress is positively correlated with performance and distress is negatively correlated with performance. The TPSM asserts that performance may be improved by the mind-body changes associated with a positive, healthy stress response (Quick, et al., 1997). For example, Soldier #1 hears an artillery shell descending (experiences a stressor); the soldier responds to the stressor with the four mind-body changes previously described; Soldier #1's visual senses and cognitive abilities are improved by the blood-flow to the brain and the large muscle groups are

primed for action; Soldier #1 jumps into a fox-hole and is sprayed with dirt rather than being killed by a nearby explosion. The positive, healthy stress response which Soldier #1 experienced improved his performance on the battlefield - he survived to fight on. In a recent study investigating psycho-physiological manifestations of stress among police recruits, those individuals with higher levels of cortisol release during a simulated emergency showed higher levels of performance than those recruits with lower levels of cortisol release (Regehr, LeBlanc, Jelley, & Barath, 2008).

Consider another hypothetical soldier experiencing combat-based stressors. Soldier #2's unit has been exposed to nearly constant artillery fire for the past 72 hours. Initially, the stress response helped Soldier #2 to go into the bunker and avoid being injured. However, as the duration of the shelling lengthens, the mind-body changes caused in response to the stressor of artillery fire have kept the soldier from sleeping and prevented him from having an appetite. After 72 hours of a heightened level of stress, the stress response reduces this soldier's performance because Soldier #2 is no longer battle-ready due to sleeplessness, fatigue, and hunger. Soldier #1 experienced a positive stress response which prevented injury and improved performance. Soldier #2 experienced a negative stress response which resulted in decreased performance.

The TPSM recognizes that distress can decrease individual performance directly and indirectly. Direct reductions in performance caused by distress include increased accident frequency, increased injury rate, and decreased performance caused by poor mental or physical health (Quick, et al., 1997). Indirect reductions in performance are also caused by distress. Distress is related to reductions in vitality, breakdowns in

communication, damages to relationships, and missed opportunities; all of these factors predict reduced individual performance (Quick, et al., 1997).

2.1.4.2 Well-Being

In general, eustress is theoretically and empirically related to improved well-being, and distress is related to decreased psychological well-being. The mind-body changes associated with the stress response can and do change individual affective states (Quick, et al., 1997). Psychological well-being can be defined as an individual's current evaluation of happiness; this happiness is generally expressed in affective terms (Schwarz & Strack, 1999). The connection between stress and affect is well studied and well understood. Folkman and Lazarus (1985) operationalized positive and negative stress in affective terms such as "thrilled" and "worried." Positive stress is linguistically associated with such positive affective terms as "enthusiastic," "exhilarated," "excited," and "euphoric." Negative stress, on the other hand, is often associated with negative affective terms such as "overwhelmed," "irritated," "stressed," "anxious," "traumatized," and "nervous." In other words, persons experiencing positive stress are more likely to be happy than those experiencing negative stress. Negative stress is a recognized antecedent of depression (Breslau, Davis, Peterson, & Schultz, 2000; Kraaij, Garnefski, & Maes, 2002; O'Donnell, Creamer, & Pattison, 2004; Pittenger & Duman, 2008), surely the opposite of happiness.

2.1.4.3 Health

Though the medical, psychological, and occupational health literature is replete with studies supporting the negative relationship between distress and health, the

relationship between positive stress and health is not well understood. Edwards and Cooper (1988) theorize that positive stress may directly and indirectly positively influence health. The direct relationship is based on the psycho-physiological changes caused by positive stress. Following their logic, positive stress could only exist for limited durations because the mind-body changes are not beneficial if prolonged. Edwards and Cooper (1988) also theorized that positive stress may indirectly improve health by reducing distress. However, these authors acknowledge that their theories are not supported by conclusive evidence.

Though the positive relationship between positive stress and health is poorly understood and under-researched, the negative relationship between negative stress and health is empirically well-supported. Studies indicate that large numbers of workers believe that they are suffering from illness brought on by work-related stress (Smith A., 2000). Perhaps the single most well studied health variable related to negative stress is cardiovascular health (Quick, et al., 1997). Work-related negative stress is an important risk factor contributing to heart disease and stroke; this is especially significant in developed countries in which cardiovascular disease is the number one cause of mortality (Xu, Kochanek, Murphy, & Tejada-Vera, 2010). Negative stress in organizations is also associated with negative medical consequences including cancer, musculoskeletal pain, headaches, and a variety of other somatic conditions (cf. Quick, et al., 1997; cf. Cooper, 1998). Other research suggests that negative stress has an indirect negative relationship to health via such behaviors as smoking, alcohol abuse, overeating, eating disorders, and depression (Quick, et al., 1997; Klein-Hessling, et al., 2005).

Of special interest to this study, are two health consequences related to stress. Increased levels of negative stress are related to increased levels of muscular skeletal pain, such as back pain, neck pain, and arthritis (Linton, 2001). Workplace stress and muscular skeletal pain occur across a wide range of occupations (Hagberg, et al., 1995). Many empirical studies have epidemiologically demonstrated the direct connection between stress and other unfavorable psycho-social conditions with increased muscular skeletal pain (Bongers, Winter, & Kompier, 1993; Ariens, van Mechelen, Bongers, & van der Wal, 2001; Bongers, Kremer, & ter Laak, 2002; Bongers, Ijmker, van den Heuvel, & Blatter, 2006).

Like back pain, headaches are theoretically and empirically linked to workplace stress. Negative stress is a significant risk factor for migraine and tension headaches (Quick, et al., 1997). Work related migraine headaches cause significant economic cost related to absenteeism and reduced productivity (Lerner, et al., 1999). Migraine headaches are a common neurological disorder and affect more than 23 million adults (Cramer, Silberstein, & Winner, 2001).

2.2 Psychological Capital

2.2.1 Foundations of the Theory

Like any emerging construct, the definition of PsyCap is evolving in the literature. Luthans et al. (2004, p.46) suggest that economic capital is "what you have," social capital is "who you know," human capital is "what you know," and psychological capital is "who you are." A more specific definition of the construct is

an individual's positive psychological state of development and is characterized by: (1) having confidence (self-efficacy) to take on and put in the necessary effort to

succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success (Luthans, Avolio, Avey, & Norman, 2007, p. 542).

From this and previous definitions, it follows that PsyCap consists of four strengths:

hope, optimism, self-efficacy, and resilience (Luthans, et al., 2004; Luthans & Youssef, 2004).

Fred Luthans and his early collaborators (Luthans, et al., 2004; Luthans & Youssef, 2004) acknowledge a connection between positive psychology and the PsyCap construct. As a set of developable strengths, PsyCap fits within the domain of positive psychology because the focus is not upon repairing damage but upon building positive strengths (Luthans, et al., 2004; Luthans & Youssef, 2004). The four strengths of PsyCap are "state-like strengths" meaning that they are relatively subject to change and development over time (Luthans, et al., 2007, p. 544). More specifically, the strengths are neither true momentary states nor are they relatively stable and difficult to change like personality factors such as extroversion (Luthans, et al., 2007).

2.2.2 Four Strengths: the First-order Constructs

2.2.2.1 Hope

Luthans and Youssef (2004, p. 152) define hope as, "having the willpower and pathways to obtain one's goals." The dimension of hope relies heavily on the research and theory of Rick Snyder along with his collaborators (Snyder, et al., 2000; Snyder, et al., 1991). In Snyder's Hope Theory, hope requires both workable cognitive pathways and goal-directed energy (Snyder, et al., 2000). In other words, for an individual to be

hopeful there must be a recognition of a goal, a recognition of a pathway to that goal, and a willingness to attain that goal. Hopelessness results when no goals are recognized, when goals are perceived to be unattainable, and when an individual is unwilling to expend any energy in order to accomplish a goal. In Hope Theory, positive emotions flow from goal attainment and negative emotions flow from goal failure (Snyder, et al., 2000). The emotions that result from individuals' prior experience with goal success or failure affect their future hopefulness (Snyder, et al., 2000).

2.2.2.2 Optimism

The dimension of optimism is firmly rooted in positive psychology and the work of Martin Seligman (2002) and his collaborators (Seligman & Csikszentmihalyi, 2000). Luthans and Youssef (2004, p. 152) define optimism as, "having the explanatory style that attributes positive events to internal, permanent and pervasive causes." Optimism is important because it provides the opportunity for individuals to internalize and take credit for positive events (Luthans & Youssef, 2004). Optimism is largely a function of attribution; optimists take credit for positive events, while pessimists attribute positive events to luck, external help, or other factors out of their control (Luthans & Youssef, 2004). According to Luthans and Youssef (2004) all types of optimism are not equal. Realistic and flexible optimism are considered to be optimal. The authors assert that unrealistic optimism may lead to foolish or dangerous behavior. Similarly, flexible optimism implies that individuals should assess the context prior to taking an optimistic stance (Luthans & Youssef, 2004). Depending upon the circumstances, optimism is not always warranted; pessimism is sometimes appropriate given the facts on the ground.

2.2.2.3 Self-Efficacy

The self-efficacy dimension relies heavily on the theory and research of Albert Bandura (1997, 1999). Self-efficacy could be considered to be task-specific, domain-specific, or general. In the PsyCap construct, self-efficacy is best understood to be domain-specific, i.e. a general positive conviction or confidence beyond a single task but within the work domain (Luthans, et al., 2007). Luthans and Youssef (2004, p. 152) define self-efficacy as, "believing in one's ability to mobilize cognitive resources and to obtain specific outcomes."

Self-efficacy has been empirically linked with a variety of positive outcomes across a variety of samples. In a longitudinal study among children, self-efficacy has been found to reduce negative health behavior and increase positive health behavior (Klein-Hessling, et al., 2005). Empirical results from a variety of samples also suggest increasing levels of individual self-efficacy results in improved coping skills and improved individual outcomes; this suggests coping is a mediator between self-efficacy and outcomes. For example, in a study among Chinese educators, evidence was found that self-efficacy reduces subjective stress and increases active coping and positive thinking (Shen, 2009). The same Chinese study concluded that individual self-efficacy was generally associated with positive coping responses and disassociated with negative responses to strain (Shen, 2009). In a different sample consisting of elderly subjects suffering stress, coping self-efficacy was found to be negatively related to emotion-oriented and avoidance-oriented coping strategies and positively related to task-oriented

coping strategies (Kraaij, et al., 2002). These results tend to confirm a mechanistic connection between self-efficacy and coping.

2.2.2.4 Resilience

The dimension of resilience is applicable to the new field positive psychology, but has been studied for decades in the field of clinical psychology. Resilience can be understood at the individual, dyadic, group, or organizational level. For example, resilience can be used to describe relationships; couples and families can be described as resilient (Greeff & Wentworth, 2009). Similarly, a team or company could be described as resilient. Within the context of PsyCap, however, resilience is an individual strength. Luthans and Youssef (2004, p. 152) define resiliency as, "having the capacity to bounce back from adversity, failure, or even seeming [*sic.*] overwhelming positive changes." Individual resilience is dependent on a variety of factors. According to one study, the demographic factors of sex, education level, and income level explain approximately 11% of the variance in resilience (Campbell-Sills, Forde, & Stein, 2009). Genetic and developmental factors may also be important with regard to individual's obtaining the strength of resiliency. For example, history of maltreatment during childhood was reported to diminish resilience among these adult victims of childhood trauma (Campbell-Sills, et al., 2009).

2.2.3 Summary of Empirical Findings Related to PsyCap

PsyCap has been shown to be applicable across a variety of populations. Several studies have provided evidence that PsyCap is a significant predictor of individual outcomes among Asian workers (Luthans, Avolio, Walumbwa, & Weixing, 2005; Zhong, 2007; Luthans, Avey, Clapp-Smith, & Li, 2008; Ke, Sun, & Li, 2009; Wen, Qi, &

Zhang, 2009; Xiao & Li, 2010). The construct has also been utilized in European (Rego, Marques, Leal, Sousa, & e Cunha, 2010; Demerouti, et al., 2011), and Australian settings (Cole, Daly, & Mak, 2009; Avey, Nimnicht, & Pigeon, 2010; McMurray, Pirola-Merlo, Sarros, & Islam, 2010).

To date, PsyCap has been linked with a number of constructs of interest to the OB/IO field. Larson and Luthans (2006) observed a significant relationship between PsyCap and job satisfaction. Larson and Luthans (2006) also found a significant relationship between PsyCap and organizational commitment. Avey, Patera, and West (2006) found that higher levels of PsyCap are generally negatively related to absenteeism behavior; specifically, PsyCap reduced involuntary absenteeism. PsyCap is positively related to job satisfaction (Luthans, et al., 2007). Evidence also indicates that PsyCap impacts individuals but also has positive effects upon accomplishing broader positive organizational change (Avey, Wernsing, & Luthans, 2008).

The first meta-analytical analysis of the impact of PsyCap on attitudes, behaviors, and performance has recently become available (Avey, et al., 2011). This meta-analysis of 51 independent samples including more than 12,000 employees provides evidence that PsyCap is a meaningful second-order construct within the field of organizational behavior. In this study, evidence is provided that an average of the four dimensions of PsyCap had positive relationships with important attitudinal and behavioral variables. Avey et al. (2011) provide evidence that PsyCap is positively related to satisfaction and commitment. The study also demonstrates that PsyCap is positively related to citizenship behaviors.

2.2.3.1 PsyCap and Performance

PsyCap, as a higher order construct, has also been theoretically and empirically connected to individual performance (Luthans, et al., 2007; Avey, et al., 2011). These findings have been consistent across a variety of cultural samples. Among a sample of Chinese workers, PsyCap was a significant predictor of work performance (Luthans, et al., 2008). PsyCap has also shown promise as a mediating link between supportive organizational climates and employee performance (Luthans, Norman, Avolio, & Avey, 2008). PsyCap has been positively linked with both supervisor-rated measures of performance and objective measures of performance such as sales (Peterson, Luthans, Avolio, Walumbwa, & Zhang, 2011). Empirical results also provide evidence that PsyCap is positively related to performance as measured by other robust performance measures; manager ratings, intra-firm referrals, and archival financial data were all positively related to performance (Avey, et al., 2010). By serving as a predictor of performance, PsyCap has the potential to improve organizational performance and be a positive change agent within organizations (Peterson, et al., 2011). Other empirical evidence confirms the potential multi-level impact of PsyCap. Empirical findings indicate that leader PsyCap is positively related and predictive of follower performance (Walumbwa, Peterson, Avolio, & Hartnell, 2010). The recent meta-analytical evidence supports the relationship between PsyCap and performance (Avey, et al., 2011). Interestingly, the magnitude of the performance relationship is not significantly different based upon performance measures utilized, i.e. PsyCap is positively related using self, subjective, and objective performance measures.

2.2.3.2 PsyCap and Well-Being

Several studies have connected the construct of PsyCap with individual well-being (Cole, et al., 2009; Avey, Luthans, Smith, & Palmer, 2010; Culbertson, Fullagar, & Mills, 2010; Avey, et al., 2011). A longitudinal study found that PsyCap was related to positive-well-being using both eudaimonic (positive functioning) and hedonic (state-happiness) operationalizations of well-being. This study provided preliminary evidence that improving PsyCap may improve well-being over time; this finding is especially robust when well-being measures focusing on mental health or overtly cognitive components are utilized (Avey, et al., 2010). Other research indicates a complex relationship between PsyCap and well-being. Culbertson et al. (2010) presented findings which differentiated the impact of PsyCap eudaimonic and hedonic well-being. The researchers found that eudaimonic well-being mediated the positive relationship between PsyCap and hedonic well-being (Culbertson, et al., 2010). This finding suggests that PsyCap increases happiness by improving life function. In other words, people with PsyCap function better resulting in a greater sense of well-being. Recent meta-analytical finding support the positive relationship between PsyCap and well-being (Avey, et al., 2011).

2.2.4 Developing Psychological Capital

Clinical psychologists are increasingly using strength-based counseling models as preventive treatments in recognition of their potential therapeutic methods (Smith E. J., 2006). In the clinical psychology literature, the development of hope, optimism, and self-efficacy have been suggested as possible mechanisms for the positive outcomes resulting from cognitive-behavior therapies (Snyder, et al., 2000). A key premise of psychological

capital is that strengths can be developed over time (Luthans, Youssef, & Avolio, 2007). An increasing body of empirical evidence supports the potential to develop PsyCap via interventions (Luthans, et al., 2006; Luthans, et al., 2008; Luthans, Avey, Avolio, & Peterson, 2010; Demerouti, et al., 2011). Peterson et al. (2011) provide empirical evidence that PsyCap changes over periods as short as several months. This finding supports the theory that the strengths of PsyCap are not permanent traits, but are state-like strengths subject to change.

This finding is also supported by efforts to train employees to develop PsyCap (Griffith, 2011). Research supports the malleability and improvability of PsyCap. Demerouti et al. (2011) used a training program based upon Rational-Emotive Therapy to increase self-reported PsyCap among trainees. Luthans et al. (2010) used PsyCap intervention (PCI) designed both to improve overall PsyCap and in each of the four dimensions. The results of this study provide additional evidence that the higher order core factor of PsyCap is developable by short-term training intervention.

2.2.4.1 Developing Hope

In order to develop hope, Luthans and Youssef (2004, p. 155) suggest careful goal-setting, "stepping" of large, complex goals into manageable sub-goals, managerial displays of confidence in employees, and preparedness via contingency-planning and mental rehearsal. Building hope has become an established goal of post trauma interventions (Resick, 2007). Within the field of clinical psychology, it has become

standard treatment for victims of large-scale disasters such as war, earthquakes, or tsunamis to develop and build hope in order to minimize the occurrence of depression and PTSD (Resick, 2007). Among children traumatized by war and political violence, clinical psychologists found that children treated with play and interpersonal therapy maintained hope more than their peers who received no such treatment (Tol, et al., 2010). This suggests that effective interventions can be developed to build hope. The same study provided evidence that therapeutic interventions reduced PTSD symptoms, however according to their analysis, hope did not mediate the relationship between therapy and PTSD symptoms (Tol, et al., 2010).

2.2.4.2 Developing Optimism

Luthans and Youssef (2004, pp. 155-156) suggest that optimism should be developed by three approaches: (1) "leniency for the past" in which individuals learn to reframe and accept past failures and setbacks and forgive themselves in order to move forward, (2) "appreciation for the present" in which individuals learn to be thankful and content with regard to the positive aspects in their current lives, and (3) "opportunity-seeking for the future" in which future uncertainties are welcomed as opportunities for growth and advancement.

2.2.4.3 Developing Self-Efficacy

A significant amount of empirical research supports the idea that self-efficacy can be developed via treatment and intervention. Among professional and non-professional rescue workers responding to a major natural disaster in Asia, lower prevalence of PTSD was found among the professionals; with higher self-efficacy (McFarlane, Williamson, &

Barton, 2009). The same study found levels of self-efficacy to be more useful than biological markers for predicting prevalence of PTSD (McFarlane, et al., 2009). Among European participants in a residential intervention program designed to improve body-awareness, the treatment improved subject self-efficacy (Landsman-Dijkstra, van Wijck, Groothoff, & Rispens, 2004). During a multi-year project in Germany, efforts to improve individual self-efficacy were successful both among students and teachers (Jerusalem & Hessling, 2009). Also in the field of clinical psychology, self-efficacy has been found to impact the kind of coping strategies used by clients suffering distress and experiencing symptoms of depression (Kraaij, et al., 2002). Clinical practitioners realize the importance of identifying existing strengths, such as self-efficacy in their clients in order to develop effective therapeutic interventions (Smith E. J., 2006); similarly, organizational interventions should take into account existing individual strengths when designing interventions. Self-efficacy interventions have been used in both clinical psychology and in educational psychology. Interventions in educational settings are relevant in the field of management because they occur within organizations and rely upon social interaction, climate, and leadership (Jerusalem & Hessling, 2009).

2.2.4.4 Developing Resilience

Empirical evidence indicates that resiliency can be developed among individuals (Luthans, Vogelgesang, & Lester, 2006). The approach to enhancing resilience suggested by Luthans and Youssef (2004) is modeling. Mentoring, observation, or even "imaginal experiences" in which individuals experience success vicariously should develop self-efficacy (Luthans & Youssef, 2004, p. 155). Luthans and Youssef (2004) suggest that the

most desirable approach to enhancing individual resilience is for individuals to experience success through actual performance attainment.

Building upon the work of Masten (2001), Luthans and Youssef (2004, p. 156) assert that resilience may be developed using three principal strategies: (1) "asset-focused" strategies emphasize developing tangible and intangible resources that increase the probability of positive outcomes, (2) "process-focused" strategies emphasize the mobilization of adaptational systems to manage emerging challenges, and (3) "risk-focused" strategies emphasize the reduction of risk factors and stressors that decrease the probability of desirable outcomes.

2.2.5 Psychological Capital Intervention

Luthans et al. (2008) used a pretest/post test with control group experimental design. The researchers administered an online intervention designed to develop PsyCap. At Time 1, treatment participants completed a 45-minute positive PsyCap intervention. Specifically, treatment participants watched an interactive video presentation in which they received a general explanation of the strengths of resilience and self-efficacy. Next, the intervention described how these strengths are applicable in the work place and to their jobs in particular. In the final phase of this first session, participants were asked to consider situations in which they felt "stuck" or "in a bind" (p. 214). Next, participants were asked to consider this situation in terms of resilient processes, resilient thinking, and efficacious thoughts and behavior. Finally, participants were asked to list a series of actions they could take in order to gain control over similar circumstances. The final step of the first treatment session asked participants to engage in written reflective exercises in which participants were asked to concentrate on past thoughts, emotions, and behaviors.

In light of the exercise, participants were then asked to cue their intentions of future behavior. At Time 1, the control group was given a decision-making exercise of the same duration using the same multimedia techniques.

In order to develop hope, Luthans, Avey et al. (2006) used micro-intervention sessions to develop individual goal-setting. First, participants identified personally valuable goals. Second, the intervention sought to: (1) set concrete endpoints to measure success, (2) utilize an approach versus an avoidance framework in order to move forward with goals, and (3) identify sub-goals in order to create small wins ("stepping"). In this micro-intervention the researchers relied on the hope treatments to improve optimism. They asserted that hope-training improved optimism by reducing options for pessimists to expect bad things. It should be noted, this approach apparently confounds hope and optimism, two dimensions of PsyCap that the same author took great pains to differentiate.

In order to develop self-efficacy, the researchers attempted to allow participants to experience success. Facilitators served as role models and subjects experienced success vicariously through the facilitators' achievements during the session. Using Masten's (2001) framework for enhancing resilience, Luthans, Avey's et al. (2006) intervention asked participants to react to a self-identified set-back. Participants were then asked to consider the causes of that set-back. Finally, the participants practiced mobilizing the resources and processes necessary to recover from a set-back.

One week following the Time 1 initial intervention session, the treatment group participated in another 45-minute multimedia online session (Time 2), designed to

develop hope and optimism. First, participants were informed of the importance of personal values and the setting of realistic challenges for accomplishing tasks and goals. Next, they were asked to write down several personally valuable, realistic, and challenging tasks at the workplace. Next, the session discussed examples of what constitutes a realistic challenge and criteria for determining whether or not a goal was personally valuable. Participants then chose one of their previously listed goals to use for the remainder of this session. Next, the participants were asked to complete a "stepping" exercise in which they created sub-goals. This second session was targeted to build hope and optimism by identifying successful activities that would lead to personal goal attainment. In addition, the Time 2 session sought to enable participants to develop a degree of task-mastery with regard to goal setting; task-mastery also builds self-efficacy. The control group at Time 2 received an alternate and very different training session on leadership and human resource development via a multimedia online exercise. In the control sessions, reflection and thinking through choices were emphasized.

The overall objective of the treatments received by the treatment group was to build all four state-like strengths contained in PsyCap (Luthans, et al., 2008). Three days following the second session, both the treatment and control groups were administered the 24-item PsyCap measure (PCQ). Results of the experiment indicated that PsyCap was significantly increased among the treatment group between the pretest and the post test, while no significant change was evident among the control group (Luthans, et al., 2008). This is evidence that PsyCap can be developed through these relatively brief interventions.

2.3 Stress and Psychological Capital

2.3.1 Stress and the Four Strengths

Each of the four constituent strengths of PsyCap has been conceptually linked to stress in the literature. Instilling and promoting hope has been identified as a crucial intervention strategy when dealing with victims of mass traumas (Hobfoll, et al., 2007). A sense of hope can assist victims of trauma by improving their problem solving and reducing feelings of distress (Hobfoll, et al., 2007). Optimism has also been conceptually and empirically linked to the stress response. Low optimism (pessimism) has been identified as a predictor of depressive symptoms during midlife for menopausal women (Bomberger & Matthews, 1996). One body of research provides evidence that optimism leads individuals to more adaptive coping strategies (Scheier & Carver, 1992). Of special significance to this dissertation is an empirical study by Segerstrom, Taylor, Kemeny, and Fahey (1998). Among a sample of law students, optimism was associated with improved mood. In addition, higher optimism predicted higher numbers of helper T cells and higher natural killer cell cytotoxicity - both significant markers of improved immune response (Segerstrom, et al., 1998). This is especially relevant to this dissertation because this provides some empirical support for a link between optimism and the psycho-physiological stress response as conceptualized in this paper.

A significant body of empirical research links self-efficacy and stress. In one body awareness intervention, evidence suggested that decreased stress related symptoms and increased self-efficacy were outcomes of the intervention (Landsman-Dijkstra, et al., 2004). Another empirical finding suggests that general self-efficacy mediates the relationship between personality factors and perceived stress. In a study among almost

3,500 northern Europeans, self-efficacy was found to mediate the negative relationship between openness, conscientiousness, extroversion, and agreeableness with perceived stress; additionally, self-efficacy was found to mediate the positive relationship between neuroticism and perceived stress (Ebstrup, et al., 2011). These findings support the existence of a possible mechanistic relationship between self-efficacy and stress.

A possible mechanism explaining this relationship concerns coping. Kraaij et al. (2002) found that self-efficacy was related to coping strategies employed. Higher self-efficacy was associated with increased task coping and decreased emotion coping (Kraaij, et al., 2002). In still another study among 530 teachers, self-efficacy was directly predictive of coping strategies. Teachers with higher general self-efficacy tended to adopt adaptive coping strategies rather than denial or disengagement (Shen, 2009).

Like the other three constituent strengths of PsyCap, a relationship between resilience and stress has been identified in the literature in some samples. Among emergency medical service personnel, prevention practices which bolster resilience have been linked to lower incidences of PTSD (Gist & Taylor, 2008). The authors of this study recommend critical incident stress management and critical incident stress debriefing interventions to build resilience among emergency workers. In a separate study among 783 victims of the 2004 Indian Ocean tsunami and earthquake, evidence was found that diminished resilience was associated with higher rates of psychopathology including post-traumatic stress symptoms and anxiety disorders (Irmansyah, et al., 2010). Neither of the above samples necessarily generalizes to the lower levels of

stress generally expected in the workplace. To date, no link has been made between resilience and stress in the business context.

Finally, Campbell-Sills et al. (2009) found that a variety of demographic and historical factors are related to individual resilience to stress. The findings of this study suggest that although factors such as sex and low education level significantly predict lower stress resilience, much of the relationship remains unexplained.

2.3.2 Stress and PsyCap

Since the development of the PsyCap construct only one paper has been published empirically connecting PsyCap with organizational stress (Avey, et al., 2009). This research was conducted among a sample of more than 400 working American adults. This study provided evidence that PsyCap has a negative relationship with negative stress related symptoms. This study provides preliminary evidence that second-order construct of PsyCap has potential as a predictor of stress-related constructs. Although these findings are intriguing, they leave several important questions unanswered.

As Avey et al. (2009) note, their research has several significant limitations. First, the study is an effort to explore PsyCap as a potential modifier of negative stress symptoms. The authors do not argue that PsyCap causes negative stress symptoms; rather, they argue that PsyCap may be a dispositional or situational modifier of negative stress symptoms per the reasoning of Nelson and Sutton (1990). Thus, though they observe a direct negative relationship between PsyCap and stress symptoms, the mechanism by which PsyCap affects stress symptoms is unexplained. Avey et al. (2009) also acknowledge that all stress is not alike. The operationalization of stress in this study only included negative stress symptoms. The potential relationship between PsyCap and

positive stress is not explored. The researchers specifically suggest that CHF as one possible avenue to guide such an exploration. Finally, Avey et al. (2009) did not contemplate nor explore eustress in their study.

CHAPTER 3

MODEL DEVELOPMENT AND HYPOTHESES

3.1 Synthetic Model of Organizational Stress

This research will utilize a synthetic model (see Figure 3.1) of organizational stress anchored by three existing models: the Transactional Model (Lazarus & Folkman, 1984; Folkman & Lazarus, 1985), the Theory of Preventive Stress Management (Quick, et al., 1997), and the Challenge-Hindrance Framework (Cavanaugh, et al., 2000). The TM and the TPSM both emerged during the 1970's and 80's viewed stress within organizations as an inevitable and ubiquitous result of individuals interacting with their environments. Both theories also modeled organizational stress as a process in which individuals respond to stimuli. Finally, both theories concurred that stressful stimuli could lead to both positive and negative consequences. Unlike the TM and the TPSM, the CHF does not attempt to explain organizational stress broadly. Rather, the CHF is an attempt to categorize stressful stimuli and to explain positive and negative work outcomes (Cavanaugh, et al., 2000; LePine, et al., 2005).

The synthetic model depicted in Figure 3.1 contains elements of all three of the above frameworks. Like the TPSM, organizational stress is described as a three-step process in which stressors predict stress responses and stress responses predict outcomes. Like the TM, the synthetic model recognizes that some stressors produce a positive stress

response while others produce a negative stress response. Unlike the TM, the synthetic model does not

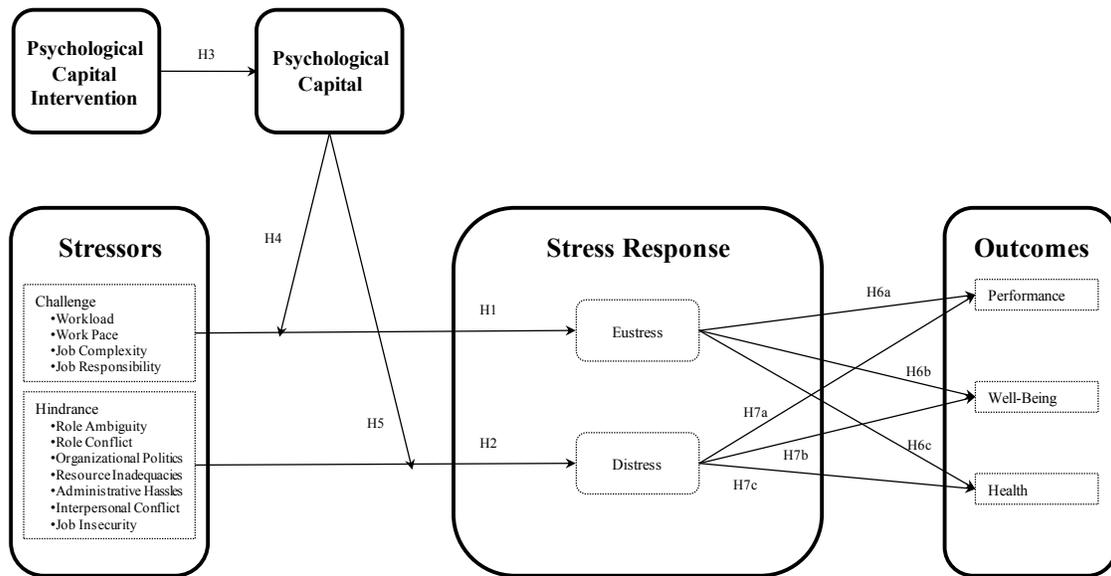


Figure 3.1 Synthetic Model of Organizational Stress

contemplate non-threat stimuli, nor does it include the primary appraisal step. Rather, the synthetic model begins with stressors which produce eustress or distress. The synthetic model's approach to stressors is based on the challenge-hindrance model. Challenge stressors lead to a positive stress response and hindrance stressors lead to a negative stress response.

The final step contemplated by the synthetic model is outcomes. Outcomes are dependent upon the stress response. Eustress predicts positive outcomes while distress predicts negative outcomes. This is consistent with both the TPSM and the challenge-hindrane framework. Eustress is associated with positive outcomes such as improved

performance, well-being, and health. Negative stress is associated with negative outcomes. Negative outcomes include decreased performance, well-being, and health.

3.2 Stressors and the Stress Response

3.2.1 Challenge Stressors and Eustress

Cavanaugh et al. (2000) do not precisely define *challenge stressors*; rather they define *challenge-related stress*. Their definition of *challenge-related stress* is not especially helpful because of its apparent tautological basis. In the paper introducing the challenge-hindrance framework, challenge-related stressors are those stressors positively related to positive work outcomes (Cavanaugh, et al., 2000). The two-dimensional model of stressors offered by later scholars using the challenge-hindrance framework argues that *challenge stressors* are "obstacles to be overcome in order to learn and achieve" (LePine, et al., 2005, p. 765). In an attempt to harmonize the challenge stressor framework with the transactional model, Podsakoff redefines *challenge stressors* as workplace demands "appraised as promoting accomplishment of job tasks and the personal development of the individual" (2007, p. 87). Evidence from a meta-analytic study indicates that particular stressors are associated with positive outcomes (LePine, et al., 2005). The current study, in part, seeks to determine specifically whether challenge stressors are associated positively with a positive stress response. This is the theoretical basis of all of the research in the challenge-hindrance literature. However, rather than seeking to measure positive stress, previous work has focused on attitudinal (LePine, et al., 2004; Haar, 2006; Podsakoff, 2007; Podsakoff, et al., 2007; Culbertson, et al., 2010; Webster, et al., 2011), behavioral (Podsakoff, et al., 2007; Rodell & Judge, 2009; Webster, et al., 2010), and performance outcomes (LePine, et al., 2004; Chong, et al., 2011). Many of

these researchers assert that the causal mechanism between challenge stressors and outcomes is eustress or positive stress. However, presumably because of measurement difficulties, none has chosen to empirically test the direct relationship between challenge stressors and positive stress. The first hypothesis of this study seeks to test this relationship.

H1: Challenge stressors are positively related to eustress.

3.2.2 Hindrance Stressors and Distress

Similar to challenge stressors, Cavanaugh et al. (2000) do not offer a robust definition of hindrance stressors. Subsequent scholars have developed the construct more carefully; *hindrance stressors* are sources of stress that unnecessarily thwart "personal growth and goal attainment" (LePine, et al., 2005, p. 765). Podsakoff redefines *hindrance stressors* as workplace demands "appraised as barriers or obstacles to the accomplishment of job tasks and the personal development of the individual" (2007, p. 88). Hindrance stressors, then, are those stressors that are mostly likely to be related to distress and least likely to be related to eustress. Some scholars have related hindrance stressors to job strain (LePine, et al., 2005). When individuals are exposed to stressors that are likely to inhibit goal attainment or thwart personal achievement, it is unlikely that the psycho-physiological response will be positive. Previous research has associated hindrance-related stressors with undesirable attitudinal (LePine, et al., 2004; Haar, 2006; Podsakoff, 2007; Podsakoff, et al., 2007; Culbertson, et al., 2010; Webster, et al., 2011) and behavioral outcomes (Podsakoff, et al., 2007; Rodell & Judge, 2009; Webster, et al.,

2010). This body of previous research has asserted that the mechanism between hindrance stressors and negative outcomes is negative stress. However, this mechanism has not been directly tested. Hypothesis 2 of this study seeks to test this mechanism.

H2: Hindrance stressors are positively related to distress.

3.3 Developing Psychological Capital through Intervention

The literature from social and clinical psychology clearly supports that each of the first order constructs of hope (Snyder, et al., 2000; Resick, 2007), self-efficacy (DiIorio, et al., 2002; Kraaij, et al., 2002; Landsman-Dijkstra, et al., 2004; Klein-Hessling, et al., 2005; Jerusalem & Hessling, 2009), and resilience (Luthans, Vogelgesang, et al., 2006; Smith E. J., 2006; Gist & Taylor, 2008; Tol, et al., 2010; Irmansyah, et al., 2010) can be affected by counseling, therapy, and other treatment interventions.

The second order concept of PsyCap has also been empirically demonstrated to be developable (Luthans, Avey, , et al., 2006; Luthans, et al., 2008; Demerouti, et al., 2011). Psychological Capital Intervention (PCI) has been demonstrated to be an effective web-based intervention to develop PsyCap (Luthans, et al., 2008). PCI, though effective, does not utilize the full range of techniques employed in the stress intervention literature. PCI uses a cognitive behavior training methodology which encourages participants to (1) understand the relevance of PsyCap, (2) develop their own sense of PsyCap, and (3) deploy their psychological capital in their work lives. Best practices from the stress

intervention literature indicate that such cognitive behavior training is effective (Richardson & Rothstein, 2008).

Best practices also indicate that web-based training alone is not as effective as organizational interventions that are multi-modal (Richardson & Rothstein, 2008). Furthermore, PCI does not involve participants practicing and applying their new PsyCap awareness in simulated circumstances. Best practices from the stress-intervention literature include rehearsal and iterative practicing as effective intervention techniques (Richardson & Rothstein, 2008). This study introduces a treatment labeled as Psychological Capital Training (PCT) that incorporates web-based training similar to PCI, face-to-face training in PsyCap, and individual and web-based practice sessions in which participants will practice being aware of PsyCap, developing their own senses of PsyCap, and applying their PsyCap in scenarios contextually connected to the workplace. PCT will be fully described in a subsequent section of this study. Consistent with theory and empirical findings concerning the developability of the constituent first order constructs and of PsyCap itself, this study asserts that PsyCap may be developed via a comprehensive multi-modal organizational training intervention. Hypothesis 3 seeks to test this assertion.

H3: Multi-modal organizational psychological capital training interventions increase individual levels of psychological capital.

3.4 Psychological Capital as a Moderator of the Stress Response

3.4.1 Secondary Stress Intervention and Prevention

The TPSM model predicts that secondary interventions, those interventions designed to minimize distress and maximize eustress, will moderate the relationship between stressors experienced by individuals and their stress responses. A significant body of empirical evidence questions the effectiveness of organizational interventions as moderators of the stressor/stress response relationship (Lamontagne, et al., 2007; Richardson & Rothstein, 2008). Effective secondary interventions promote eustress and minimize distress. This study seeks to test whether PCT has potential as a secondary stress prevention intervention.

3.4.2 Psychological Capital as an Enhancer of the Challenge Stressor-Eustress Relationship

All four of the constituent strengths (the first order constructs) of PsyCap have been theoretically and empirically connected with the stress response (Snyder, et al., 2000; DiIorio, et al., 2002; Kraaij, et al., 2002; Landsman-Dijkstra, et al., 2004; Klein-Hessling, et al., 2005; Smith E. J., 2006; O'Connor & Cassidy, 2007; Gist & Taylor, 2008; Campbell-Sills, et al., 2009; Greeff & Wentworth, 2009; Jerusalem & Hessling, 2009; McFarlane, et al., 2009; Shen, 2009; Irmansyah, et al., 2010; Tol, et al., 2010). In one recent study, evidence was presented that the second order construct of PsyCap is related to improved stress response (Avey, et al., 2009). This study used a unidimensional operationalization of stressors. In the discussion section of this same paper, the researchers called for a more nuanced measurement of stressors and suggested

the challenge hindrance framework as one potential avenue for investigation (Avey, , et al., 2009). The present study seeks to respond to this suggestion.

As previously mentioned, challenge stressors are related to goal accomplishment and achievement. For example, when a supervisor assigns a project, this may be a stressful event, but the accomplishment of the assignment will be directly related to work achievement, and hopefully related to individual goal attainment. All four constituent strengths of PsyCap should enhance an individual's reaction to such a stressor. Hopeful individuals will be more likely than hopeless individuals to believe that the assignment is achievable. Optimistic individuals are more likely than pessimistic individuals to connect their own internal resources with achieving the assignment than pessimistic individuals. Individuals who are self-efficacious will tend to believe that their own actions and abilities will enable the achievement of the assignment. Finally, resilient individuals will be more likely to overcome and work through any potential obstacles to achievement. Thus, all four first order constructs are conceptually related to the stressor/stress response relationship. Because PsyCap is a second order construct dependent upon the four constituent strengths, and because all four of these strengths are associated with improving the stress response, individuals high in PsyCap should respond to challenge stressors more positively than individuals low in PsyCap. PsyCap, then, enhances the positive relationship between challenge stressors and positive stress. Hypothesis 4 of this study seeks to test this moderating relationship.

H4: Psychological capital moderates the positive relationship between challenge and positive stress response such that the relationship between challenge stressors and eustress is enhanced by high psychological capital and dampened by low psychological capital.

3.4.3 Psychological Capital as a Ameliorator of the Hindrance Stressor-Distress Relationship

As previously mentioned, all four of the constituent strengths of PsyCap have been theoretically and empirically connected with the stress response. Hindrance stressors, such as interpersonal conflict, are perceived as unnecessary barriers to achievement. For example, a worker's boss is regularly rude and unkind. The boss speaks and behaves disrespectfully in interactions with the worker. Clearly, this would create a stressful situation. According to the challenge-hindrance framework, this kind of stressor would be perceived as an unnecessary obstacle and would be more likely to produce distress. This study will argue that PsyCap interacts with hindrance stressors to moderate the distress. High levels of PsyCap should be associated with an amelioration of the distress. Individuals who are hopeful might perceive that the boss could change. Optimistic individuals might attribute rude, unkind behavior to the boss' problems and be less likely to take the behavior as a personal attack. Self-efficacious individuals might believe that their own actions could reduce the boss' negative behavior. Resilient individuals are more likely to shrug off the boss' behavior as "no big deal" or cope with the behavior as "just one of those things" that has to be endured. All four constituent strengths, then, are conceptually connected with a dampening effect. Similarly, individuals with high levels of PsyCap should experience less negative stress than

individuals with low levels of PsyCap when experiencing hindrance stressors.

Hypothesis 5 of this study seeks to test this assertion.

H5: Psychological capital moderates the positive relationship between hindrance and distress such that the relationship between hindrance and distress is ameliorated by high psychological capital and enhanced by low psychological capital.

3.5 Outcomes Associated with Eustress and Distress

3.5.1 Stress Response and Performance

All three conceptual models upon which the synthetic model offered in this research concur that eustress is connected with positive individual outcomes. This research will provide additional empirical tests of this theoretical relationship using three important individual outcomes frequently used in the occupational stress literature.

Eustress is theoretically associated with improved performance (Quick, et al., 1997; Nelson & Simmons, 2011). The psycho-physiological stress response places a variety of potentially advantageous resources at the disposal of individuals. Two mind-body changes occurring during a positive stress response have particular potential to improve work performance: increased sensory acuity and increased blood flow to the brain and large muscle groups (Quick, et al., 1997). Empirical research using the CHF has provided substantial evidence to support this theory (Avey, et al., 2011). Hypothesis 6a of this study will test the relationship between eustress and performance.

H6a: Eustress is positively related to performance.

Distress is theoretically connected with reduced performance (Quick, et al., 1997; Cooper, 1998; Cavanaugh, et al., 2000). High-intensity and long-duration stressors have been empirically connected to reductions in performance (Quick, et al., 1997). Recent work using the CHF has produced evidence that hindrance-related stress is negatively related to performance (Chong, et al., 2011). Hypotheses 7a of this study seeks to test this relationship.

H7a: Distress is negatively related to performance.

3.5.2 Stress Response and Well-Being

Eustress has been theoretically connected with individual well-being (Quick et al., 2013) and empirically connected to positive emotional states (Podsakoff, 2007). Similarly, distress has been theoretically and empirically connected with negative well-being (Podsakoff, 2007). Emotions such as happiness are subject to changes triggered by a variety of stimuli. Eustress should trigger positive changes in perceived happiness; normal, healthy stress should help individuals adapt to challenges and encourage positive emotions. Distress, on the other hand should trigger negative changes in emotion; being unable to cope with or adapt to unnecessary obstacles to goal attainment is more likely to produce unhappiness than happiness. Hypotheses 6b and 7b seek to test the relationships between positive and negative stress and well-being.

H6b: Eustress is positively related to well-being.

H7b: Distress is negatively related to well-being.

3.5.3 Stress Response and Health

Positive stress should be a ubiquitous and optimal individual state among people working in organizations; it should be a normal part of everyday work life. Modern work life in developed nations is different in many ways from earlier agricultural civilizations or still earlier traditional hunter-gatherer societies. Modern work is often less physically demanding and far more sedentary. Technological advancement has separated workers in economically developed societies from much of the hard labor typical in less developed countries and typical for the long evolutionary history of *Homo sapiens*. Though traditional work life is different, it is not now, nor never has been, free of stress. Both the farmer behind the plow and the gatherer digging root vegetables experienced work related stressors and dealt with those stressors either with eustress or distress. In theory, health has always been related to positive stress as an adaptation to the inevitable demands that environments place on human beings.

Despite this theoretical connection, there has been little empirical investigation into the connection between eustress and health. Edwards & Cooper (1998) theorized that the psycho-physiological changes induced by the state of positive stress may improve health. Hypothesis 6c of this study seeks to test this theory.

H6c: Eustress is positively related to health.

Distress has been linked with many adverse health consequences (cf. Quick, et al., 1997; c.f. Cooper, 1998). Specifically, negative stress has been correlated with muscular skeletal pain (Bongers, et al., 1993; Ariens, et al., 2001; Bongers, et al., 2002; Bongers, et al., 2006) and headache (Quick, et al., 1997). Hypothesis 7c of this study seeks to confirm the relationship between distress and health.

H7c: Distress is negatively related to health.

CHAPTER 4

METHOD

4.1 Sample

The site for this research is a closely held corporation located in a large southwestern metropolitan area (hereinafter "Company"). This well-established company is a market leader in a niche publishing industry, has existed for more than ninety years, and has experienced a large increase in sales volume over the past fifteen years. This study was approved by Company's president and majority stockholder. During the past fifteen years, Company has transitioned from publishing specialty volumes to offering traditional publishing services, online publishing services, and consulting services within their field. Company currently has approximately 110 full-time employees. Of these, 92 have no supervisory or managerial function: 70 are involved in telephone sales, seven are involved in outside sales, and 15 are involved in operations and support. There are two levels of management, supervisory managers and members of the senior leadership team. Approximately 18 of the 110 Company employees manage other people. The Company clearly elucidates its purpose, mission, and values (Hall, 2011). Relevant to this study, Company's values statement specifies that people "have potential" and "have the capacity for greatness." The values statement continues by stating that Company wishes to hire optimistic people "who have a positive mental attitude, who take

ownership for themselves, and who trust that persistence and a strong work ethic are the keys to success."

Demographic information for the employees of Company was recorded. The effects of demographics on the variables of interest was explored to determine if demographic factors affect the relationships among the variables of interest. Demographic data was collected via self-report and archival measures.

4.2 Experimental Design

4.2.1. Randomized Field Experiment with Control

The study was a randomized field experiment with control using a pretest, treatment, post test design. In order to limit threats to validity, a randomization procedure is highly desirable. All employees (with the exception of the president) of Company were randomly assigned to the treatment group or the waitlist group. During the course of this study, only the treatment group received the treatment. No placebo treatment was contemplated. The only systematic difference between the treatment group and the waitlist group was participation in the treatment itself. Field experiments do not allow for as much experimental control as laboratory settings, however, the "real-world" nature of field experiments increases their overall generalizability and often improves their believability from a practitioner's standpoint.

A pretest, treatment, post test design was selected to decrease the number of alternative explanations for any results of this study. All participants in this study, whether treatment group or waitlist group, participated in all pretests and post tests. Pretests and post tests were administered via an online survey instrument (surveymonkey.com).

4.3 Study Procedures

The primary study was conducted over a period of six weeks. Table 4.1 summarizes this procedure. The procedure was intended to minimize alternative explanations of variance among the variables. The first step in this study was to collect information from Company regarding its employees. Next, all Company employees were sent an email invitation to participate in a voluntary training and research event. As part of this email, all employees were given the opportunity to give their informed consent to participate in the training and research event. Also, each employee was provided with a discrete password to use in all subsequent surveys and training sessions. All subjects who did not respond to this email invitation were contacted by the primary researcher either by phone, in person, or by follow-up email. Prior to any data being collected from employees or any treatment being given to employees, all employees were randomly assigned to either the treatment group or the waitlist group. After randomization, membership of groups were analyzed to ensure that no significant difference existed between the two groups with regard to demographic information provided by Company. Employees assigned to the treatment group ("treatment subjects") were informed that they were the first to be trained. All employees assigned to the waitlist group ("waitlist subjects") were informed that they would receive the training during the following year. All subjects were also informed of the survey procedures. Next, all subjects were informed of the incentive program associated with the training. They were informed that

Table 4.1 - Primary Study Procedure

Time	Target Start Date	Procedure	Constructs Measured
T0	30-Sep	Randomize all Company employees into treatment and waitlist groups. Archival Company-based data collection.	
T1	3-Oct	Pretest (Survey 1)	PsyCap, challenge stressors, hindrance stressors, well-being, health
T2	11-Oct	Treatment 1- Lunch and Learn: Introduction to stress - evaluation - cope & thrive framework; Introduction to PsyCap strengths.	PCT
T3	17-Oct	Treatment 2 - Passive web-based training: Hope & Self-Efficacy	PCT
T4	18-Oct	Treatment 3 - Passive web-based training: Optimism & Resilience	PCT
T5	25-Oct	Treatment 4 - Face to face seminar: Thriving & Coping using strengths	PCT
T6	31-Oct	Treatment 5 - Web-based exercise for Hope	PCT
T7	1-Nov	Treatment 6 - Web-based exercise for Self-Efficacy	PCT
T8	2-Nov	Treatment 7 - Web-based exercise for Optimism	PCT
T9	3-Nov	Treatment 8 - Web-based exercise for Resilience	PCT
T10	10-Nov	Post test 1 (Survey 2)	PsyCap, eustress, distress
T11	14-Nov	Post test 2 (Survey 3)	well-being, health
T12	14-Nov	Post test 3 (Survey 4)	in-role performance

during each completed step of the training random drawings would be held for gift cards (\$10 to \$20).

4.3.1 Pretest

Following informed consent, randomization, and study notification, all subjects were invited by email to participate in the pretest (Survey 1). The first survey was open for eight days; the survey consisted of approximately 190 items. Subjects were allowed to take the survey while at work, and several computers were provided for this purpose. Subjects were also allowed to take the survey from their own machines. Subjects who

did not respond to the survey were sent email reminders at the end of days two, four, six, and seven. The primary researcher followed-up by phone with those who did not respond by the end of day seven.

4.3.2. Psychological Capital Training

The Psychological Capital Training (PCT) was initiated within one day after the completion of the pretest. PCT was conducted in eight discrete sequential steps. In the first of these eight steps (Treatment 1), treatment subjects were invited to attend one of two "Lunch & Learn" sessions. These sessions were modified from similar sessions conducted by Organizational Wellness & Learning Systems (OWLS), a well-established consulting firm located in a southwestern city (organizationalwellness.com). During Treatment 1 sessions, treatment subjects were provided free sandwiches, salad, and soft drinks and participated in a seminar conducted by the primary researcher. The treatment subjects were informed that Company was initiating a "Strengths Building Training Program" designed to improve individual and organizational outcomes at Company. Treatment subjects were informed that they were selected at random to be the first recipients of the training program and that all employees would get the training over the next few months. During the Treatment 1 sessions, treatment subjects were introduced to the Stress to Evaluation to Coping Model as used in OWLS Execuprev Stress Module. In addition, treatment subjects were informed of the role that individual strengths play in the evaluation process. Treatment subjects were then introduced to the individual strengths of hope, optimism, self-efficacy, and resilience as constructs that have the potential to affect the evaluation process. Finally, treatment subjects were provided with a schedule which listed the subsequent seven training steps and the survey procedures of the study.

The second treatment step in PCT was a passive web-based training program (Treatment 2). Treatment 2 began approximately the first work day following the completion of Treatment 1. All treatment subjects were invited by email to participate in a web-based training during work hours. Treatment 2 was open for three work days and the primary researcher followed up with additional invitations to treatment subjects who had not responded by the end of day one or by the end of day two. The content of Treatment 2 was based upon the practices known as Psychological Capital Intervention (Luthans, et al., 2008). The form of Treatment 2 was modified from the OWLS Stress Module of the Execuprev Program. Treatment 2 introduced treatment subjects to the PsyCap constituent strengths of hope and self-efficacy. Each strength was defined, exemplified, and linked to a specific historical hero who models this strength. Next, treatment subjects were provided with concrete suggestions of how to recognize and develop each strength. All subjects who completed Treatment 2 were sent an email invitation to participate in Treatment 3.

The procedure for and description of Treatment 3 was identical to Treatment 2 except the strengths being taught were the PsyCap constituent strengths of optimism and resilience. Treatments 2 and 3 were available for the full work week following Treatment 1. All subjects who completed Treatment 3 were sent an email invitation to participate in Treatment 4 the following work week.

Treatment 4 was a two hour face-to-face seminar conducted by the primary researcher. Treatment 4 sessions began during the work week following Treatments 2 and 3. Treatment subjects were scheduled to attend one of five sessions based upon their

work schedule availability. No fewer than ten and no more than twenty subjects attended any given session. The form of this session was based upon stress-intervention seminars provided by OWLS. First, the Stress-Evaluate (with strengths) Cope & Thrive model was reviewed. Following this review, treatment subjects were asked to identify some work-based stressors at Company. They were then asked to nominate coworkers within the seminar who exemplified PsyCap strengths when encountering these stressors. A discussion followed regarding how these strengths could meaningfully be applied to situations at Company. Finally, each treatment subject was given a handout in which they were asked to visualize an instance in which hope, optimism, self-efficacy, and resilience could affect his or her response to an organizational stressor. Following this exercise, the facilitator asked for volunteers to share their visualizations. All treatment subjects who participated in Treatment 4 were given links and passwords for Treatment 5.

Treatment 5 was a web-based exercise designed to enable treatment subjects to develop the PsyCap constituent strength of hope. This exercise was designed to take less than 15 minutes to complete. The form was based on cognitive behavior therapy homework which was designed to help treatment subjects to practice using the information and skills learned during the previous training treatments. During this exercise, treatment subjects were provided a second-person vignette about a stressful stimulus at Company. They were then asked a series of four open-ended questions connecting hope and the stressful stimulus. The four questions were: (1) "How can hope help you respond to this situation?", (2) "How can you develop your own sense of

hope?", (3) "How is being hopeful likely to change the outcome of this situation for you?", and (4) "How might being hopeful improve your life or help you achieve important goals?" All treatment subjects who participated in Treatment 5 were given links and passwords for Treatment 6.

Treatments 6, 7, and 8 were designed in exactly the same way as Treatment 5, except the second-person vignette and the four questions related to the PsyCap constituent strengths of optimism, self-efficacy, and resilience, respectively. Treatment 5 opened one day following Treatment 4. Treatments 5, 6, 7, and 8 were open for a total of ten work days following Treatment 4. Treatment subjects were tracked for completion every two days. Treatment subjects who had not participated during any two day period were sent email reminders to participate.

4.3.3. Post tests

Following the completion of all PCT treatments, three post tests were administered. The first post test (Survey 2) was administered one week following the closing of Treatment 8. Luthans et al. (2008) used a three day wait period between treatment and post test. This study uses a slightly longer period to accommodate the needs of the Company. The first post test included the constructs of PsyCap, eustress, and distress. This online survey instrument was designed to take less than ten minutes to complete. This survey was administered to all treatment subjects and waitlist subjects. This survey was open for five work days beginning on the Monday following the closing of Treatment 8. Subjects who did not respond were sent email reminders at the end of day two and day four.

The second post test (Survey 3) was open for five work days. Subjects who did not respond were sent email reminders at the end of day two and day four. The second post test included the constructs of well-being and health and was designed to take less than 15 minutes to complete. The second post test was administered to both treatment subjects and waitlist subjects.

The third post test (Survey 4) ran concurrently with the second post test. The third post test was administered only to persons in a supervisory role at Company. This survey asked supervisors to rate the in-role performance of the employees whom they supervised. Supervisors were asked to evaluate all of their supervisees. This survey was designed to take less than four minutes per employee evaluated.

4.4 Measures

4.4.1 Independent Variables

4.4.1.1 Challenge Stressors

Challenge stressors were measured using self-report scales. Participants were asked a total of six items from Cavanaugh et al. (2000). In this scale, participants were asked to respond to six work related items using a Likert scale ranging from 1 ("produces no stress") to 5 ("produces a great deal of stress"). Some sample items from the Cavanaugh et al. (2000) scale included "The amount of time I spend at work" and "Time pressures I experience." Cavanaugh et al. (2000) assessed the content validity and internal consistency of the six item scale and reported a Cronbach's alpha ($\alpha=.87$) well above the accepted criterion. Numerous other published studies have utilized this challenge stressor scale or variations thereof (Boswell, et al., 2004; LePine, et al., 2004; Haar, 2006; Culbertson, et al., 2010; Webster, et al., 2010; Webster, et al., 2011).

4.4.1.2 Hindrance Stressors

Hindrance stressors were measured using the same procedure as challenge stressors. Similarly, hindrance stressors were measured using five items from Cavanaugh et al. (2000). In this scale, participants are asked to respond how much stress is produced by five work-related items using a Likert scale ranging from 1 ("produces no stress") to 5 ("produces a great deal of stress"). Some sample items from the Cavanaugh et al. (2000) scale include "The amount of red tape I need to go through to get my job done," and "The lack of job security I have." Cavanaugh et al. (2000) assessed the content validity and internal consistency of the five item scale and reported a Cronbach's alpha ($\alpha=.75$) well above the accepted criterion. Numerous other published studies have utilized this hindrance stressor scale or variations thereof (Boswell, et al., 2004; LePine, et al., 2004; Haar, 2006; Culbertson, et al., 2010; Webster, et al., 2010; Webster, et al., 2011).

4.4.2 Dependent and Moderating Variable - Psychological Capital

Psychological capital is a dependent variable in this study with regard to Hypothesis 3, testing the efficacy of the PCT treatment. Psychological capital is a moderating variable with regard to Hypotheses 4 and 5 concerning the interaction of psychological capital with stressors to produce stress responses. In both cases, psychological capital was measured using the 24-item Psychological Capital Questionnaire (PCQ-24) as first published in Luthans et al. (2007). This scale, using items taken from existing validated scales, was assembled using rigorous psychometric procedures. The scale was assessed for internal validity, test/retest reliability, convergent validity, discriminant validity, and predictive validity. Various forms of the PCQ have

been utilized in numerous studies published in established journals. Recent meta-analytic results support the PCQ as a valid measure for psychological capital (Avey, et al., 2011).

The PCQ-24 measures each of the four dimensions of psychological capital: hope, optimism, self-efficacy, and resilience. Each dimensional subscale uses multiple items. The instructions for the PCQ-24 ask respondents to indicate their level of agreement or disagreement with a series of statements. Respondents indicate their agreement using a Likert scale (1=strongly disagree, 2= disagree, 3=somewhat disagree, 4=somewhat agree, 5=agree, 6=strongly agree). *Hope* subscale items include "Right now I see myself as being pretty successful at work," and "I can think of many ways to reach my current work goals." For the *optimism* subscale, items include "I always look on the bright side of things regarding my job," and "I am optimistic about what will happen to me in the future as it pertains to work." Items for the *self-efficacy* subscale include "I feel confident contributing to discussions about the Company's strategy," and "I feel confident presenting information to a group of colleagues." *Resilience* subscale items include "I can get through difficult times at work because I have experienced difficulty before," and "I can be 'on my own' so to speak at work if I have to."

4.4.3 Dependent and Independent Variables - Eustress and Distress

In the synthetic model offered in this study, stressors predict stress response and stress response predicts outcomes. Specifically, this study hypothesizes that the stress response can be either positive or negative. Because there are no existing measurement scales to operationalize eustress and distress as conceptualized in this study, a scale development study was undertaken to create and validate scales to accurately measure these constructs. This scale development study preceded the primary study and utilized

separate samples. The following sections identify the procedure for developing the Self-Report Stress Response Questionnaire (SRSRQ).

4.4.3.1 Scale Development Study

In the field of psychometrics, the process of creating and validating self-report survey scales is an entire subdiscipline within the behavioral sciences (Embretson, 1996; Schwarz, 1999; DeVillis, 2003). Reviewing the entire literature of this discipline is well-beyond the scope of this dissertation. However, hypothesis testing is only as accurate as the measurements used to operationalize the constructs (Cronbach & Meehl, 1955; Mitchell, 1997; DeVillis, 2003). As such, care must be taken to insure that measures used in the field are sufficiently valid to provide meaningful tests of hypotheses. Figure 4.1 contains five steps which should be followed to develop a valid scale. The steps are based upon a synthesis of best psychometric practices found in the behavioral and organizational literature (Churchill, 1979; Schwab, 1980; Fornell & Larcker, 1981; Aquino & Reed, 2002; DeVillis, 2003; Eby, Butts, Lockwood, & Simon, 2004; MacKenzie, Podsakoff, & Jarvis, 2005; Podsakoff, 2007).

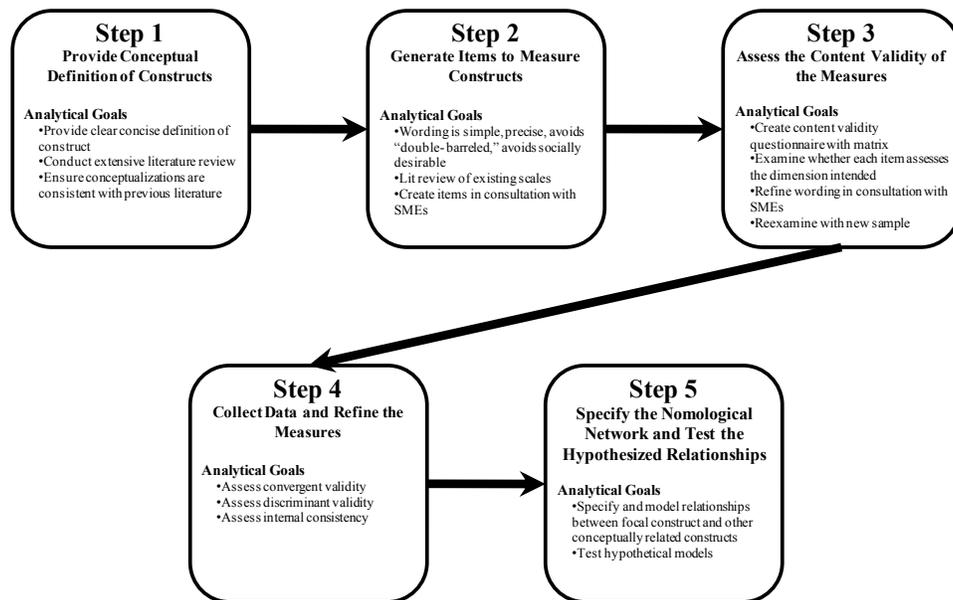


Figure 4.1 Steps for Scale Development

4.4.3.1.1 Step 1 - Conceptual Definition of Eustress and Distress

Though there is broad agreement that careful definition of theoretical constructs is the necessary first step in scale development (Churchill, 1979; DeVillis, 2003), there is little practical guidance on how to accomplish this important step (Podsakoff, 2007). Following Podsakoff's (2007) recent scale development effort within the field of occupational stress, this dissertation accomplished this step by (1) conducting a literature review, (2) ensuring that conceptualizations are consistent with previous literature, and (3) generating clear and concise definitions of both of the constructs seeking to be measured by the SRSRQ.

As previously mentioned, *eustress* is grounded in the organizational stress literature (Selye, 1975; Lazarus & Folkman, 1984; Quick, et al., 1997; Nelson & Simmons, 2011). Within the TPSM, *eustress* is defined as "the healthy, positive,

constructive outcome of stressful events and the stress response (Quick, et al., 1997, p. 4). Within the TM, *positive stress* is one possible outcome of secondary appraisal (Lazarus & Folkman, 1984). Both the TPSM and the TM theorize that eustress is the condition which precedes positive outcomes associated with stress. This study offers a definition which builds upon this conceptualization. *Eustress* is defined as a constructive and advantageous psycho-physiological response to stressors. This study also specifies that which eustress is not. Eustress is not a positive stressor; eustress is not an outcome associated with a positive stress response. Eustress is not a behavior; eustress is not an emotion.

The TPSM defines *individual distress* as "the degree of physiological, psychological, and behavioral deviation from an individual's healthy functioning" (Quick, et al., 1997, p. 5). Within the conceptual framework offered by the TM, negative stress occurs when the magnitude of stressor exceeds the coping resources of the exposed individual (Lazarus & Folkman, 1984). Negative stress in the TM, like distress in the TPSM, is the unhealthy response to stressors. This study offers a definition which builds upon both of these definitions. This study defines *distress* as a destructive and disadvantageous psycho-physiological response to stressors. This study also specifies that which distress is not. Distress is not a negative stressor; distress is not an outcome associated with a negative stress response. Distress is not a behavior; distress is not an emotion.

Now that eustress and distress have been defined, it is advisable to consider again the relationship between the constructs. As previously asserted in this paper, positive

stress and negative stress are not two poles of one unidimensional scale (Lazarus & Folkman, 1984). Individuals can and do experience both positive and negative stress in response to the same stressor. For example, soldiers in combat may simultaneously benefit from positive stress by surviving and suffer from negative stress by unexpected evacuation of the bowels. Often the unidimensional assumption causes measurement problems. In the citizenship behavior (OCB) and counter-productive workforce behavior (CWB) literature, a similar problem occurs. Many studies have measured these two distinct constructs as one unidimensional scale. They have argued that positive discretionary behaviors are on the opposite pole of negative discretionary behaviors. However, careful meta-analytic work has demonstrated that this is not the case (Dalal, 2005). In fact, though OCB and CWB are moderately negatively correlated, employees often simultaneously engage in discretionary positive and negative behaviors (Sackett, Berry, & Wiemann, 2006). Findings that support citizenship behavior and counter-productive behavior as lying on one dimension are more likely to be artifacts of imprecise measurement than accurate empirical results (Dalal, 2005; Fox, Spector, Goh, Bruursema, & Kessler, 2011). Dalal (2005) attributes this measurement error in part to the use of Likert-based agreement scales rather than frequency scales. For example, an individual might be asked to agree or disagree with the following statements: "I often voluntarily help my co-workers when they are behind in their work," and "I often spread rumors about my co-workers." A hypothetical respondent to these questions may respond "strongly agree" to the first statement and "strongly disagree" to the second statement. These responses would support a finding that citizenship behavior and

counter-productive behavior were inversely related. A more precise measurement of the two constructs would use frequency scales rather than agreement scales (Dalal, 2005). The respondents would be asked to describe how frequently they engage in particular behaviors. For example, items might read: "How often do you voluntarily help co-workers when they are behind on their work" and "How often do you spread rumors about co-workers?" The same hypothetical respondent to these questions might respond "All the time" and "Sometimes," respectively. These responses would not indicate a unidimensional relationship; rather they would support that citizenship behavior and counter-productive behavior are discriminant constructs. It is the assertion of this research that frequency scales should be similarly used to measure positive and negative stress.

4.4.3.1.2 Step 2 - Generate Items

Consistent with classical test theory, items generated for a scale should be reflective indicators of the underlying construct (Bollen & Lennox, 1991; DeVillis, 2003; MacKenzie, et al., 2005); this means that "items should be highly correlated, interchangeable, and have similar relationships with antecedents and consequences" (Podsakoff, 2007, p. 32). When reflective items are generated for a scale, it is important to note that these items should represent a sample of the total population of the possible items which could measure a construct (Bollen, 1984; Bollen & Lennox, 1991). To generate reflective items for the SRSRQ, the following three substeps are taken: (1) conduct a literature review of existing related measures, (2) carefully word items to insure simplicity, clarity, and avoid social desirability, and (3) consult with subject matter experts (SMEs) to ensure that items reflect the construct of interest.

As previously mentioned, a comprehensive review of the existing scales in the organizational and behavioral sciences identified no scales that attempted to measure the constructs of eustress and distress as conceptualized in this study. Though hundreds of empirical studies have contemplated the outcomes associated with stress, almost all have focused on the outcomes rather than the stress response. Schwarzer and Knoll (2003) identified eight organizational stress instruments, none of which are fully conceptually congruent with this study's definition of eustress or distress. For both positive and negative outcomes associated with stress, the two most common approaches to measurement have been the coping-based approach and the emotion-based approach. Unfortunately, neither approach is satisfactory for this study.

The coping-based approach is often used to measure stress outcomes. However, theory indicates that coping is situationally dependent and not theoretically equivalent to eustress or distress (Folkman & Lazarus, 1985; Schwarzer & Knoll, 2003). *Coping* is defined by Folkman and Lazarus (1980) as the "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person." Coping's behavioral component makes it significantly dissimilar to this study's definition of eustress and distress. Simply put, eustress and distress are psycho-physiological states not behaviors.

Coping can be characterized as positive and negative, or can be divided into various taxonomies such as emotion-coping, task-coping, action-coping, and avoidance-coping. Over the past decades dozens of coping measures have been offered. As part of the literature review for this study, perhaps the three most utilized coping instruments

were considered as potential operationalizations of eustress and distress: the Ways of Coping Scale (Folkman & Lazarus, 1985), the Occupational Stress Inventory's Coping Skills Subscale (Cooper, Sloan, & Williams, 1988), and the Coping Inventory for Stressful Situations (Endler & Parker, 1989; Endler & Parker, 1990). All of these well-used instruments assess frequencies of various methods or styles of coping. All concur that coping has an important situational component. When researchers have attempted to operationalize distress from the coping perspective, they focus on negative behaviors such as drinking alcohol or problem avoidance rather than a more generalized negative response. Of the three most dominant instruments from the coping literature, none take a generalized approach (Folkman & Lazarus, 1985; Cooper, et al., 1988; Endler & Parker, 1990a; Endler & Parker, 1990).

O'Sullivan (2011) developed another coping-based approach to the operationalization of eustress based upon Quick's et al. (1997) definition of eustress. Called the Eustress Scale, the scale consisted of ten (the full scale had fifteen items, but five were designed as filler items) original items designed to assess the level of positive stress experienced by students (O'Sullivan, 2011). The author reports that the scale is internally consistent over two administrations ($\alpha=.77$ on the first administration and $\alpha=.81$ on the second administration) and reliable over time. The intended context of O'Sullivan's (2011) scale is education.

The emotion-based approach to stress measurement comes closer to this study's definition of eustress and distress than the coping-based approach. This approach operationalizes eustress as stressor related emotions. However, the emotion-based

approach presents its own set of conceptual problems. Basing their operationalization of positive stress on the work of Selye (1975), Folkman and Lazarus (1985) used emotion-based measures focusing on the "positive" portion of the construct. Using this approach, eustress is associated with such adjectives as "hopeful" and "exhilarated." This approach is unsatisfactory in this study for two reasons. First, positive emotions and eustress are not conceptually identical; positive affect is an outcome associated with the constructive and advantageous stress response not the response itself. Second, from a practical standpoint in this study, the Folkman and Lazarus (1985) positive items appear to be difficult to discriminate from psychological capital measures and well-being measures. "Hopeful" clearly relates to the PsyCap dimension of *hope*. "Exhilarated" seems on its face to be related to well-being items such as "exited" and "enthusiastic."

The emotion-based approach has often been followed by those researchers using the TM (Folkman & Lazarus, 1985; Podsakoff, 2007) and the job strain and the demand-control models based on the work of Robert Karasek (1979,1998). Some of these emotion-based instruments include Folkman and Lazarus' (1985) five-item harm scale, Maslach and Jackson's (1986) emotional exhaustion scale, and Maslach, Jackson, and Leiter's (1997) Maslach's Burnout Inventory. All three of these scales utilize items focusing on negative emotional response including such language as "worried" (Folkman & Lazarus, 1985), "I feel emotionally drained at work" (Maslach & Jackson, 1986), and "depressed" (Maslach, et al., 1997). As with positive affect and eustress, negative emotions are not identical to distress; negative affect is an outcome associated with the destructive and disadvantageous stress response not the response itself.

One final established scale worthy of mention is the Perceived Stress Scale (PSS) as introduced by Cohen, Kamarck, & Mermelstein (1983). The PSS uses both coping-based and emotion-based items and seeks to measure both positive and negative appraised stress. The PSS has been used in more than 100 published studies in the clinical psychology and medical literature. It uses a frequency scale to ask respondents how often they feel and think in particular ways. Sample items include: "In the last month, how often have you felt that you were unable to control the important things in your life?" and "In the last month, how often have you felt confident about your ability to handle your personal problems?" (Cohen, et al., 1983). Like O'Sullivan's (2011) eustress scale, the PSS was not specifically designed for use in organizational settings. This scale attempts to measure stress appraisal, a construct closely related to stress response. Ultimately it is not suitable for this study because of its reliance on coping-based and emotion-based language, and because it measures positive and negative stress on one continuum rather than as two dimensions.

Following a careful search of the literature for existing scales, the next step in generating items is to create items whose wording is simple, clear, and which avoid biasing language (DeVillis, 2003). Simple wording means that items should be minimally complex and should not ask compound questions. It also means that language should be suitable for the populations to be tested. Clear language means that items should not be ambiguous in meaning nor should subjects have difficulty in understanding the item on its face. Items should not possess biasing language. Of special concern is not

using items that induce responses based on social desirability (Schwarz, 1999; DeVillis, 2003).

4.4.3.1.3 Step 3 - Assess Content Validity

Scale items with high content validity thoroughly and accurately assess relevant aspects of the conceptual domains they are intended to measure (Bryant, 2000). Two scale validation studies were completed (Content Validity Study 1 and Content Validity Study 2). In Content Validity Study 1, a sample of volunteer graduate students in management at a large southwestern research university were administered a survey. In order to evaluate content validity, respondents were presented with a 3 x 4 matrix for each of the 84 items. The three rows on the matrix were "positive response," "negative response," and "not sure whether this is positive or negative." The columns in the matrix were "cognitive response (thinking)," "emotional response (feeling)," "physical response," and "not sure what kind of response this is." The instructions asked participants to read each item carefully and (1) to assess whether the item was positive or negative, (2) to assess whether the item was cognitive, emotional, or physical, and (3) to select the option that best described the content of the item. Thus, for each item, respondents were given 12 choices and asked to select the one that best fit the item content.

The purpose of Content Validity Study 2 was also to assess the content validity of the proposed items. A sample of volunteer undergraduate students in management at a large southwestern research university were administered a survey. The questionnaire was developed using Podsakoff's (2007) content validation procedure, which is a modified version of Hinkin and Tracey's (1999) content validation procedure. This

questionnaire included a matrix of 84 items located in rows along with definitions of the six distinct dimensions of stress response. The six definitions were as follows: “positive cognitive response” was defined as “advantageous or constructive cognitive (thinking) response to stressors;” “positive affective response” was defined as an “advantageous or constructive affective (emotional) response to stressors;” “positive physiological response” was defined as an “advantageous or constructive physiological (physical body) response to stressors;” “negative cognitive response” was defined as “disadvantageous or destructive cognitive (thinking) response to stressors;” “negative affective response” was defined as “disadvantageous or destructive affective (emotional) response to stressors;” and, “negative physiological response” was defined as “disadvantageous or destructive physiological (physical body) response to stressors.” Respondents were asked to carefully read each of the six definitions. Next, they were requested to carefully read the item in each row. Then, they were asked to compare the item to the definition and rate the degree to which they believed the item was captured by the definition. Respondents rated each item's comparison to each definition with the following five point rating scale: 1 = “not at all captured by the definition,” 2 = “slightly captured by the definition,” 3 = “moderately captured by the definition,” 4 = “mostly captured by the definition,” and 5 = “completely captured by the definition.”

4.4.3.1.4 Step 4 - Collect Data and Refine Measures

During step four of the scale development process for the SRSRQ, the following validity issues were addressed: internal consistency, convergent validity, discriminant validity, and retest reliability. A new and larger group of management students at a large southwestern research university were used as a sample to assess scale validity. A survey

(Validity Study 3) was administered to the students. The surveys included the prospective scale items for eustress and distress and a number of demographic questions. Additionally, items from four scales were selected to assess convergent validity: [Academic] Eustress Scale (O'Sullivan, 2011), the Perceived Stress Scale (Cohen, et al., 1983), the Proactive Coping Inventory (Greenglass, et al., 1999), and the Neuroticism Scale. Finally, items from four other scales were selected to assess discriminant validity: Openness, Conscientiousness, and Extroversion (Soto & John, 2009), and the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).

4.4.3.1.5 Step 5 - Specify Nomological Network and Test Hypothesized Relationships

Step five of the scale development process for the SRSRQ was accomplished in the primary study. The nomological network is specified by the synthetic model found in Figure 3.1. Hypotheses 6a, 6b, and 6c are tests of the predictive validity of the eustress scale. Hypotheses 7a, 7b, and 7c are tests of the predictive validity of the distress scale.

4.4.4. Dependent Variables

4.4.4.1. Performance

In this study, performance was operationalized using a supervisor-reported scale, the Williams and Anderson (1991) in-role performance scale. This scale is a seven item Likert agreement scale designed to normatively assess workers' in-role behaviors. Sample items included "Adequately completes assigned duties," and "Performs tasks that are expected of him/her." In their original article, the authors assessed the internal validity, convergent validity, discriminant validity, and predictive validity of the scale.

The literature indicates that supervisor-reported performance measures are far more desirable than self-reported measures. Supervisor-reported measures avoid problems of common methods bias. Supervisors at the site of this study were accustomed to rating employee performance and providing objective feedback. Therefore, supervisors could be assumed to be the most competent raters with regard to normative performance and company work standards.

4.4.4.2. Well-Being

Well-being was operationalized by two scales. The first scale, the "Wright Well-Being Indicator," has 20 items in two ten-item dimensions, positive and negative well-being (Wright, Huang, & Wefald, 2009; Wright & Huang, 2009; Hargrove, Wright, & Quick, 2011). Respondents were asked to indicate the extent to which they generally felt a series of emotions (1=very slightly/not at all, 2=a little, 3=moderately, 4=quite a bit, 5=extremely). Sample positive items included "cheerful" and "pleased." Sample negative items included "sad" and "miserable." Positive items and negative items were both used in this questionnaire with negative items being reverse-coded for the analysis. Preliminary psychometric data indicated that this scale is internally consistent (positive subscale $\alpha=0.88$, negative subscale $\alpha=0.80$) (Hargrove, et al., 2011). Additionally, this scale is reliable across a variety of Asian and American samples (Wright, et al., 2009; Wright & Huang, 2009; Hargrove, et al., 2011). In order to focus respondents' ratings on the study period, the time anchor "past few weeks" is utilized.

The second self-report scale for well-being is the Positive Affect Negative Affect Scale (PANAS) consisting of ten positive items designed to assess positive emotions

(Watson, Clark, & Tellegen, 1988). This established scale has been used in hundreds of studies in the behavioral and organizational sciences. Respondents were asked to rate the extent to which they feel a series of emotions on a five point scale ("very slightly or not at all," "a little," "moderately," "quite a bit," "extremely"). Sample items were "interested" and "alert." In order to focus respondents' ratings on the study period, the time anchor "past few weeks" is utilized.

4.4.4.3. Health

Health was operationalized using three validated measures from the medical literature. The first scale is the SF-12v2® Health Survey© introduced by Ware, Kosinski, and Dewey (2000). This survey has been used to operationalize health in numerous medical studies and in the occupational health and organizational behavior literature (Hammer, Kossek, Anger, Bodner, & Zimmerman, 2010). The scale consists of 12 items and two dimensions: physical and mental health. This scale has high internal consistency, high retest reliability, and strong predictive validity as reported by the authors and numerous validation studies (Ware, et al., 2000; Ware, Kosinski, Turner-Bowker, & Gandek, 2002; Cheak-Zamora, Wyrwich, & McBride, 2009; Fleishman, Selim, & Kazis, 2010). The questionnaire is designed to provide two scores, a physical health score and a mental health score. A sample item from this scale is "During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?" Respondents were asked to rate the answer using a five point scale (1="All of the time," 2="Most of the time," 3="Some of the time," 4="A little of the time," 5="None of the time").

The second scale used to operationalize health is the Örebro Musculoskeletal Screening Questionnaire, the OMSQ (Gabel, Melloh, Yelland, Burkett, & Roiko, 2011). Musculoskeletal pain is one component of health; moreover musculoskeletal pain is theoretically and empirically related to stress (Quick, et al., 1997). This scale is an improvement of a much-used earlier scale, the OMPQ. The authors report that the scale has strong face validity, content validity, reliability (0.975, $p < 0.05$, ICC:2.1), criterion validity (Spearman's $r = 0.97$), and internal consistency ($\alpha = 0.84$). The OMSQ consists of 21 items. For this study, eight items were chosen that possess content closely related to this study's investigation and context. The first three items ask the respondent to answer questions using an 11 point Likert agreement scale (0="Completely disagree," 10="Completely agree"). The instructions for the first three items read: "The following three (3) statements are what people have said about their pain/problem. For each statement, please circle ONE number from 0 to 10. This shows how much physical or normal daily activity (e.g. bending, lifting, carrying, walking, driving, travel, etc) affects your pain/problem." A sample of the three items is "An increase in my pain/problem tells me I should stop what I am doing until my pain/problem decreases." The next five items have the following instructions: "Here is a list of five (5) activities. Please circle the number that best describes your current ability to participate in each of these activities due to your pain/problem." Respondents rated their ability to participate on an 11 point scale (0="Not at all," 10="Completely"). Sample items include: "I can walk for an hour or participate in my normal light recreational or sporting activities" and "I can manage my regular daily routine and social activities (e.g. shopping, transport or seeing friends)."

The third scale used to operationalize health is the Headache Needs Assessment Survey, the HANA (Cramer, et al.). Pain and discomfort from headaches is a common health symptom; moreover headache pain is theoretically and empirically related to stress (Quick, et al., 1997). The HANA is designed to assess two dimensions of headache pain: frequency and bothersomeness. The authors of the scale report good convergent validity, good discriminant validity, high internal consistency ($\alpha=0.89$) and adequate retest reliability (0.77). HANA presents a set of seven problems to the respondent. Two samples are: "Problem 3. I have felt I am not in control of myself because of my headaches" and "Problem 5. I functioned and worked (attention, concentration, etc.) at a lower level than I should have because of my headaches." The respondents were asked to rate each of the seven problems using two separate questions as anchors. The first question is frequency-based "How often has this problem occurred?" and rated on a five point scale (1="never," 2="rarely," 3="sometimes," 4="often," 5="all the time"). The second question is based on bothersomeness, "How much has this problem bothered you?" and rated on a five point scale (1="not at all," 2="a little," 3="some," 4="a lot," 5="a great deal").

The three scales taken together provide a multi-dimensional measure of individual health. The advantages of using multiple measures include the minimization of mono-modal measurement bias and a more nuanced measurement than merely general health.

4.4.5. Demographic Variables

Demographic variables were collected using both self-report instruments and archival data collected from the Company. The Company provided archival data for the participants concerning their tenure with the Company, job title, job level, and pay.

Statistical analyses were performed to ascertain whether demographic variables were significantly related to any of the variables of interest.

CHAPTER 5

RESULTS

5.1 Scale Development Studies

5.1.1 Item Generation

First, a comprehensive literature review of scales used in both individual and organizational stress was conducted. The literature review confirmed that no published scale purported to measure the two primary dimensions of interest, distress and eustress.

Items were generated to assess six possible dimensions of stress response (negative affective, negative cognitive, negative physiological, positive affective, positive cognitive, and positive physiological). One hundred twenty items were developed; twenty items were developed to reflect each of the six dimensions. Subject matter experts (SMEs) were consulted to review the content validity of the items. The SMEs included three senior scholars in stress related research and two experts in psychometrics. Each SME was provided with definitions of each construct. The definitions were identical to those enumerated in section 4.4.3.1.3 of this work. Based on their input, the list was narrowed to 84 potential items measuring stress response: twelve for negative affect, fourteen for negative cognitive, sixteen for negative physiological, fifteen for positive affect, fourteen for positive cognitive, and thirteen for positive physiological.

These 84 items were then sent to two SMEs with graduate degrees in English or Rhetoric to review the wording of each of the 84 items for grammatical structure and logic. All items were checked by the SMEs to ensure that no "double barreled" or

compound items existed; additionally the SMEs checked to ensure that all 84 items were simple clauses or sentences and in the past tense. Next, the SMEs reviewed the wording of the items to ensure precision and readability. Minor changes were made to some items. Finally, each of the 84 items was scored using the Flesh-Kincaid Grade Level Readability Scale embedded in Microsoft Office. No item scored higher than 9.0, indicating that the items are readable by people who read at a 9th grade level.

5.1.2 Content Validity Studies

In order to assess the content validity of the 84 items generated in step two, two empirical studies were performed using separate samples.

5.1.2.1 Content Validity Study 1

Study 1 was conducted among a sample of MBA students enrolled at a major southwestern university. Participants were offered extra credit for their participation and were enrolled in three different graduate sections. Ninety six potential participants were contacted by email with a link to an online survey. Of these, there were 58 usable responses (60.4% response rate). The identity of all respondents was verified by use of a discrete login number. There was a firewall between the participant responses and their names to ensure that the respondents remained anonymous. Among those responding, 28 were male and 30 were female. The average age of those responding was 31 years old. Fifty-one respondents (85.0%) were employed. The sample was moderately ethnically diverse: 39 respondents (65.0%) were white, 11 respondents (18.3%) were Asian, and 7 respondents (11.7%) were black or African-American. In a second ethnicity question, three respondents (5.2%) identified themselves as Hispanic. Finally, 29 respondents

(48.3%) had never been married, 27 respondents (45.0%) were married, and four (6.7%) were divorced.

In order to evaluate content validity, respondents were presented with a 3 x 4 matrix for each of the 84 items. The instructions asked participants to assign each item to the most appropriate cell in the matrix. Thus, for each item, respondents were given 12 choices and asked to select the one that best fit the item content.

For each of the 84 items, only one choice was consistent with the hypothesized construct. For example, the item "...pressure at work has put me in a bad mood" was hypothesized to reflect the negative affective dimension of stress response. If a respondent selected the matrix choice "negative response, emotional response (feeling)," the response was scored as correct. If a respondent selected any other of the 11 possible choices in the matrix, the response was scored as incorrect. For each item a correct choice ratio was then computed. Table 5.1 summarizes the results for the eustress items and Table 5.2 summarizes the results for the distress items. If respondents selected randomly, the expected correct choice ratio would be 0.08; the average correct choice ratio was significantly higher 0.69 ($\chi^2_{1, N=56}=505.57, p<0.001$). The literature provides no clear guidance as to what level of correct choice ratio is indicative of acceptable construct validity. Items with a correct choice ratio of 0.70 were selected to be retained for consideration in the prospective scale; thus, all items retained had a correct choice ratio above the mean and more than eight times the expected value of a random

Table 5.1

Content Validity Study Results, Positive Stress Response Items

Item	Study 1	Study 2						Difference between top two means	Justification for Elimination	
	correct choice ratio	PosCog mean	PosAff mean	PosPhys mean	NegCog mean	NegAff mean	NegPhys mean		Criterion 1	Criterion 2
...pressure at work has improved my mood.	0.77	2.87	3.72	2.41	1.71	1.75	1.76	0.85		
...work stress has made me thrilled about work.	0.82	3.02	3.72	2.57	2.05	1.97	1.78	0.71		
... pressure at work has made me feel upbeat.	0.70	2.91	3.75	2.72	1.82	1.87	1.78	0.84		
...I make better decisions because of work stress.	0.79	3.83	3.04	2.18	1.90	1.84	1.79	0.79		
...work stress has helped me think clearly	0.80	3.92	2.81	2.35	1.72	1.70	1.58	1.12		
...pressure at work has stimulated my ability to think about important tasks.	0.80	3.88	2.79	2.45	1.92	1.83	1.79	1.43		
...my ability to think has been improved by work stress.	0.77	3.99	2.98	2.57	1.78	1.73	1.72	1.02		
...work stress has helped me accomplish thinking tasks at work.	0.73	3.87	2.86	2.31	1.89	1.82	1.84	1.01		
... pressure at work has improved the quality of my decisions.	0.77	3.97	3.08	2.52	1.75	1.67	1.61	0.89		
... pressure at work has improved my ability to solve problems.	0.88	3.98	3.02	2.55	1.73	1.76	1.59	0.95		
...work stress has stimulated my ability to think.	0.70	3.77	2.82	2.57	2.35	2.11	2.03	0.95		
...pressure at work has helped me focus on my work.	0.77	3.92	3.23	2.64	1.71	1.68	1.57	0.68		
... I have been able to think better because of pressure at work.	0.79	3.93	2.78	2.42	1.85	1.72	1.71	1.15		
...work stress has improved my thinking about tasks at work.	0.80	4.05	2.94	2.34	1.78	1.71	1.64	1.11		
... pressure has stimulated my mind at work.	0.82	3.85	3.02	2.58	1.95	1.85	1.72	0.83		
... I am more focused because of work stress.	0.82	3.78	3.09	2.57	1.81	1.82	1.81	0.68		
... pressure at work has improved my ability to physically accomplish tasks.	0.70	2.95	2.83	3.86	1.69	1.75	1.69	1.03		
...I have had more physical energy because of work stress.	0.72	2.62	2.73	4.02	1.72	1.77	1.74	1.28		
...work stress has helped me to accomplish physical tasks at work.	0.71	2.75	2.75	3.94	1.78	1.74	1.76	1.18		
...work stress gives me more physical endurance.	0.77	2.55	2.67	3.87	1.82	1.76	1.90	1.20		
...I felt more motivated because of pressure at work.	0.65	3.32	3.69	2.85	1.80	1.79	1.67	0.38	fail	
... I have felt enthusiastic about accomplishing tasks because of work pressure.	0.75	3.27	3.78	2.60	1.89	1.74	1.85	0.52		fail
...pressure at work has made me feel excited.	0.74	3.28	3.63	2.82	1.92	1.89	1.88	0.35		fail
... pressure at work invigorates me.	0.61	3.08	3.38	2.98	1.98	2.02	1.81	0.31	fail	
...work stress has excited me.	0.62	3.38	3.69	3.08	1.94	1.90	1.80	0.31	fail	
...I felt eager to accomplish tasks when experiencing work pressure.	0.67	3.29	3.65	2.64	1.92	1.92	2.02	0.36	fail	
...I have responded enthusiastically to work stress.	0.73	3.25	3.81	2.78	1.87	1.68	1.69	0.55		fail
... pressure at work makes me feel more eager to work.	0.63	3.17	3.62	2.93	1.82	1.80	1.67	0.45	fail	fail
...I have happily responded to pressure at work.	0.64	3.66	3.80	3.13	1.89	1.88	1.94	0.14	fail	fail
...pressure at work has inspired me.	0.54	3.31	3.72	2.54	1.72	1.60	1.64	0.41	fail	fail
...work stress has made me feel more eager to work.	0.30	2.98	3.11	2.77	2.32	2.19	2.10	0.12	fail	fail
... I have felt mentally exhilarated because of pressure at work.	0.39	3.36	3.25	2.47	2.22	2.11	1.95	0.12	fail	fail
...work stress keeps me engaged at work.	0.27	3.69	3.28	2.82	1.90	1.80	missing data	0.40	fail	fail
... my response to pressure at work has been more physical activity.	0.64	2.49	2.57	3.60	1.86	1.95	2.35	1.03	fail	
... work pressure has made me feel physically stronger.	0.65	2.76	2.87	3.81	1.58	1.69	1.81	0.94	fail	
... I have felt a physical boost from pressure at work.	0.58	2.84	2.91	3.81	1.91	1.85	1.80	0.90	fail	
... work pressure has made me feel physically stronger.	0.60	2.72	2.78	3.90	1.78	1.75	1.84	1.12	fail	
... pressure at work energizes me.	0.40	3.19	3.22	3.63	1.74	1.80	1.71	0.41	fail	
... pressure at work revitalizes me when I feel sluggish.	0.21	2.82	3.29	3.32	1.86	1.92	1.85	0.03	fail	
...pressure at work makes my heart beat with excitement.	0.37	2.73	3.41	3.23	1.82	1.85	1.96	0.18	fail	fail
...work stress has given me the energy I need to get the job done.	0.52	3.16	3.24	3.83	1.84	1.85	1.75	0.59	fail	
...work stress has given me the strength to accomplish tasks.	0.43	3.31	3.19	3.75	1.76	1.68	1.78	0.44	fail	

Table 5.2

Content Validity Study Results, Negative Stress Response Items

Item	Study 1 correct choice ratio	Study 2						Difference between top two means	Justification for Elimination	
		PosCog mean	PosAff mean	PosPhys mean	NegCog mean	NegAff mean	NegPhys mean		Criterion 1	Criterion 2
...I felt uneasy because of work stress.	0.80	1.86	1.78	1.77	2.97	3.74	2.53	1.21		
...work stress has made me feel sad.	0.86	1.71	1.63	1.62	3.02	3.98	2.59	0.95		
...I felt annoyed when experiencing work pressure.	0.79	1.84	1.87	1.67	3.02	3.87	2.51	0.85		
...pressure at work has made me feel dejected.	0.82	1.77	1.78	1.61	3.22	3.72	2.51	0.49		
...I have felt irritable because of work stress.	0.70	1.82	1.91	1.75	3.18	3.85	2.72	0.66		
... pressure at work has made me feel miserable.	0.81	1.70	1.75	1.75	3.09	3.83	2.78	0.74		
...I am ill-tempered from dealing with work stress.	0.75	1.75	1.68	1.77	2.95	3.69	2.54	0.74		
...work stress has made me feel anxious.	0.79	2.10	2.16	1.89	2.75	3.72	2.39	0.97		
...pressure at work has put me in a bad mood.	0.88	1.82	1.86	1.81	2.93	3.78	2.38	0.85		
... pressure at work makes me agitated.	0.79	1.94	1.97	1.92	2.98	3.69	2.76	0.71		
...I have responded angrily to pressure at work.	0.76	1.69	1.67	1.75	3.30	4.08	2.91	0.78		
... work stress has made it more difficult to concentrate.	0.86	1.83	1.75	1.79	3.89	3.08	2.48	1.42		
... work stress has decreased my ability to think.	0.95	1.88	1.72	1.66	3.76	2.65	2.38	1.11		
... work stress has decreased my ability to solve problems.	0.86	1.69	1.67	1.62	3.98	2.79	2.37	1.60		
...pressure at work has hurt my ability to think clearly.	0.79	1.83	1.72	1.72	4.01	3.07	2.52	0.94		
... my thinking is unfocused because of stress at work.	0.79	1.71	1.71	1.73	4.01	2.87	2.37	1.14		
... stress at work has decreased the quality of my decisions.	0.82	1.80	1.77	1.59	3.84	3.01	2.29	0.83		
...work stress has decreased my ability to think clearly.	0.88	1.77	1.73	1.78	3.88	2.89	2.31	0.98		
...work stress has caused me to lose focus on my work.	0.73	1.72	1.65	1.68	3.89	3.15	2.46	0.75		
... work stress has decreased the quality of my decisions.	0.72	2.00	2.08	1.80	3.91	3.24	2.67	0.67		
...stress at work has made me feel physical discomfort.	0.88	1.78	1.73	1.89	2.48	2.69	3.92	1.23		
... I have felt physically exhausted because of stress at work.	0.74	1.66	1.67	1.85	2.91	3.05	4.01	0.96		
...I have had less physical energy because of work stress.	0.80	1.80	1.94	1.92	2.45	2.55	3.93	1.38		
... my response to stress at work has been less physical activity.	0.73	1.80	1.78	1.91	2.47	2.55	3.79	1.24		
... stress at work has decreased my physical performance.	0.84	1.77	1.75	1.91	2.55	2.60	3.79	1.19		
... stress at work has made me feel physically weak.	0.79	1.71	1.73	1.78	2.76	2.96	4.09	1.13		
... stress at work has decreased my ability to physically accomplish tasks.	0.79	1.70	1.69	1.76	2.76	2.76	3.80	1.04		
... stress at work has caused me to be fatigued.	0.70	1.77	1.72	1.78	2.88	3.02	3.83	0.82		
... I have felt worried because of stress at work.	0.72	1.86	1.78	1.83	3.60	3.79	2.82	0.19		fail
...I made worse decisions because of work stress.	0.80	1.78	1.75	1.82	3.85	3.27	2.34	0.58		fail
...pressure at work makes my thinking fuzzy.	0.68	2.12	2.08	2.09	3.47	2.99	2.82	0.48	fail	
... pressure at work has distracted me.	0.56	1.93	2.01	1.83	3.61	3.22	2.79	0.39	fail	fail
...I was less focused because of pressure at work.	0.51	2.02	1.98	1.92	3.56	3.19	2.60	0.37	fail	fail
...work stress has distracted me from accomplishing work tasks.	0.56	1.84	1.68	1.82	3.51	3.18	2.61	0.33	fail	fail
...pressure at work has decreased my endurance.	0.67	1.71	1.72	1.77	2.96	3.08	3.77	0.69	fail	
...pressure at work has made me feel physically tense.	0.68	1.92	1.92	1.97	2.89	3.13	3.94	0.81	fail	
...pressure at work has kept me from accomplishing physical tasks.	0.65	1.77	1.78	1.82	2.84	2.86	3.67	0.81	fail	
... my response to pressure at work has been less physical activity.	0.65	2.02	2.03	2.24	2.57	2.45	3.69	1.12	fail	
...stress at work has made me feel sick.	0.61	1.66	1.68	1.80	2.94	3.32	3.87	0.55	fail	fail
... stress at work has made me feel tense.	0.60	1.88	1.88	1.81	3.06	3.23	3.51	0.28	fail	fail
...work stress has made me feel tense.	0.30	1.98	1.88	1.81	2.97	3.38	3.48	0.10	fail	fail
...work stress has made me jittery.	0.56	1.92	1.96	2.09	2.78	2.97	3.20	0.23	fail	fail

choice. Items with a correct choice ration of below 0.70 were eliminated from future consideration (Elimination Criterion 1).

5.1.2.2 Content Validity Study 2

Content Validity Study 2 was conducted in order to provide an independent content validity assessment of the 84 proposed items. Participants were undergraduates enrolled in sophomore and junior level business classes. Students participated in the study in order to fulfill their departmental research requirement. Students who did not wish to participate completed an alternate research assignment. One hundred forty-four students received an invitation via email with a link to the survey. One hundred thirty usable responses were received (response rate = 90.28%). The identity of all respondents was verified by use of a discrete login number. There was a firewall between the participant responses and their names to protect the anonymity of the respondents. Among those participants responding to the demographic questions, 87 (64.4%) were male. The average age of those responding was 24.22 years old. Seventy-seven respondents (57.1%) were employed. The sample was ethnically diverse: 62 respondents (50.0%) were white, 37 respondents (29.8%) were Asian, 12 respondents (9.7%) were black or African-American, and 13 respondents (10.5%) were multi-racial. In a second ethnicity question, 30 respondents (24.0%) identified themselves as Hispanic. Respondents who did not respond to demographic questions were not excluded from the study.

Each of the 84 items received six ratings, one for each of the six dimension definitions. An average rating was computed for each of the 84 items across the six

dimension definitions and the difference between the highest two means was computed. Tables 5.1 and 5.2 contain the results of Content Validity Study 2. Hinkin and Tracey (1999) used an ANOVA procedure followed by a Duncan's Multiple Range test to establish significance levels between means among the separate dimensions. After performing these analyses, it became apparent that very few items would be eliminated using this procedure. Therefore, a more conservative approach was taken requiring a difference between the highest mean and the second highest mean to be greater than 0.60. This difference would produce a highly significant difference between two highest means ($p < 0.001$) for each of the items retained using Hinkin and Tracey's (1999) procedure. The second criterion for elimination (Elimination Criterion 2) eliminated all items with a difference between two highest means less than 0.60.

5.1.2.3 Content Validity Analysis

As a result of the Content Validity Studies a total of 36 prospective items were eliminated. Seventeen items were eliminated by only Elimination Criterion 1, five items were eliminated only by Elimination Criterion 2, and fourteen items were eliminated by both elimination criteria. The two independent content validity studies taken together provide strong evidence for the content validity of the 48 remaining prospective items. These 48 items are unshaded in Tables 5.1 and 5.2.

5.1.3 Scale Validity Study 3

Study 3 examined inter-item correlations, the factor structure of the proposed items, convergent validity, discriminant validity, and reliability of the scales.

Undergraduate business students at a large southwestern university participated in a study

to investigate the factor structure, validity, and reliability of the scale. A total of 458 students were invited by email to participate in an online survey. Two hundred ninety-one students were offered extra credit as an incentive and 167 were invited to fulfill their departmental research requirement via this survey. A total of 322 (response rate = 70.31%) usable responses were recorded. Data were collected over a ten day period. The identity of all respondents was verified by use of a discrete login number. There was a firewall between the participant responses and their names to protect the anonymity of the respondents. All students were enrolled at the same university and department at the same time. Many did not complete demographic questions. Among those who did, 75 males and 49 females reported their sex. The average age was 24.04 years (n=123). Ninety-nine participants were working, and 34 were not employed. Among the 101 students who responded to the ethnicity question, 55 (54.4%) were white, 23 (22.8%) were Asian, 17 (16.8%) were black or African-American, 5 (4.9%) were from multiple races, one was an American Indian or Alaskan Native. Finally, 31 of 113 (27.4%) were Hispanic. Due to the relatively low response rate for these demographic questions, it is problematic to conclude that these respondents represent the demographics of the sample as a whole. Respondents who did not respond to demographic questions were not excluded from the study. Participants were blind to the purpose of the study.

To assess convergent and discriminant validity, respondents were asked to answer questions using the 48 prospective items for the Self Report Stress Response Questionnaire (SRSRQ) and to respond to questions from a number of other scales used in the organizational and behavioral literature. Items from four scales were selected to

assess convergent validity: [Academic] Eustress Scale (O'Sullivan, 2011), the Perceived Stress Scale (Cohen, et al., 1983), the Proactive Coping Inventory (Greenglass, et al., 1999), and the Neuroticism Scale. Items from four other scales were selected to assess discriminant validity: Openness, Conscientiousness, and Extroversion (Soto & John, 2009), and the Satisfaction with Life Scale (Diener, et al., 1985).

5.1.3.1 Exploratory Factor Analysis

Common factor analysis with varimax rotation was conducted using the 48 prospective items for the SRSRQ. Common factor analysis was chosen because we assumed an underlying factor structure. Listwise deletion was used to deal with missing data. The initial extractions resulted in seven factors with Eigenvalues greater than one. Table 5.3 summarizes the initial eigenvalues and variance explained for the initial extraction.

Table 5.3 - 48 Item EFA Initial Results

Initial Eigenvalues and Variance Explained			
Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	15.996	33.324	33.324
2	9.429	19.644	52.968
3	1.927	4.014	56.983
4	1.855	3.864	60.847
5	1.410	2.937	63.784
6	1.088	2.267	66.051
7	1.000	2.084	68.135

The first two factors contained almost 53% of the total variance in the analysis. Factor one accounted for 31.3% of the variance and factor two accounted for 19.6% of the variance. The third factor accounted for 4.01% of the variance, and each of the subsequent factors for less than 4%. A scree plot was graphed (Figure 5.1).

An analysis of the scree plot supported a two factor solution following the "above the elbow" rule proposed by Cattell (1966). Given the large slope change visible in the scree plot and the large difference between variance accounted for by factors one

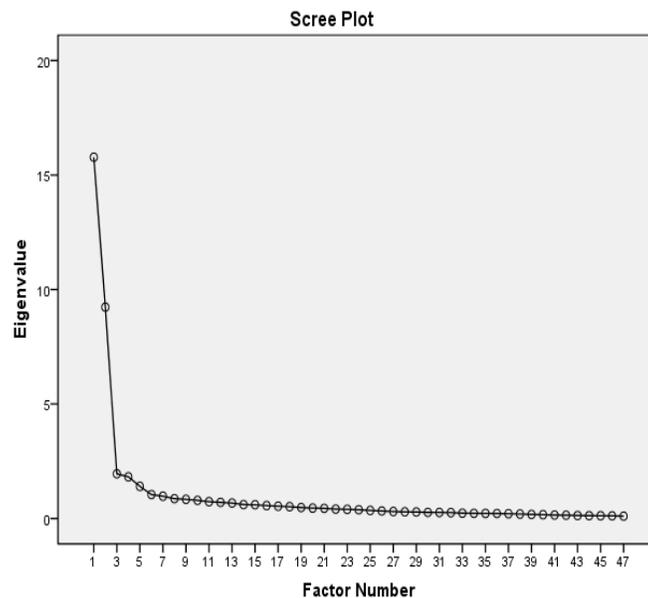


Figure 5.1 - Scree Plot for 48 Item EFA

and two compared to factors three through seven, a subsequent EFA fixed the number of factors to two.

Factor loadings of this two factor extraction are presented in Table 5.4. Because of the intention to develop a parsimonious scale with high levels of inter- item correlation, two criteria were used to identify items to retain: (1) no cross-loading greater than 0.20

between factors, and (2) minimum factor loading of 0.75. As a result of these strict criteria, thirty-two prospective

Table 5.4 - Rotated Factor Matrix

Rotated Factor Matrix		
Item	Factor	
	1	2
... my thinking is unfocused because of stress at work.	.854	
...pressure at work has hurt my ability to think clearly.	.816	
... stress at work has decreased the quality of my decisions.	.815	
... pressure at work makes me agitated.	.791	
...work stress has decreased my ability to think clearly.	.782	
... stress at work has made me feel physically weak.	.779	
... pressure at work has made me feel miserable.	.768	
... work stress has decreased my ability to think.	.763	
... stress at work has decreased my physical performance.	.763	
...work stress has caused me to lose focus on my work.	.754	
... I have been able to think better because of pressure at work.		.816
...work stress has helped me accomplish thinking tasks at work.		.807
...work stress has helped me think clearly		.795
...my ability to think has been improved by work stress.		.781
...pressure at work has helped me focus on my work.		.760
...work stress has helped me to accomplish physical tasks at work.		.754
...pressure at work has put me in a bad mood.	.747	
... work stress has made it more difficult to concentrate.	.746	
...work stress has made me feel sad.	.743	
... I have felt physically exhausted because of stress at work.	.742	
...I have had less physical energy because of work stress.	.739	
... stress at work has caused me to be fatigued.	.738	
... work stress has decreased the quality of my decisions.	.718	
...I felt annoyed when experiencing work pressure.	.713	
... stress at work has decreased my ability to physically accomplish tasks.	.712	
...I am ill-tempered from dealing with work stress.	.711	
...I have responded angrily to pressure at work.	.708	
...pressure at work has made me feel dejected.	.704	
...I have felt irritable because of work stress.	.677	
... work stress has decreased my ability to solve problems.	.657	
...I felt uneasy because of work stress.	.578	
...work stress has made me feel anxious.	.569	
...stress at work has made me feel physical discomfort.	.523	
... my response to stress at work has been less physical activity.		.748
... pressure at work has improved my ability to solve problems.		.742
...I am more focused because of work stress.		.730
... pressure at work has improved the quality of my decisions.		.703
...work stress has improved my thinking about tasks at work.		.651
...pressure at work has stimulated my ability to think about important tasks.		.644
...I make better decisions because of work stress.		.630
... pressure at work has improved my ability to physically accomplish tasks.		.613
... pressure has stimulated my mind at work.		.613
...work stress has made me thrilled about work.		.592
...work stress has stimulated my ability to think.		.583
...work stress gives me more physical endurance.		.557
...pressure at work has improved my mood.		.548
... pressure at work has made me feel upbeat.		.527
...I have had more physical energy because of work stress.		

items (shaded in grey in Table 4) were eliminated. Of the sixteen remaining items, ten loaded on the first factor and six on the second factor. There was no cross-loading for any item greater than 0.20.

5.1.3.2 Factor Structure and Final Item Selection

The ten items loading on factor one were all intended to measure distress, indicating that factor one represents the distress construct. The six items loading on the second factor were all intended to measure eustress, indicating that factor two represents the eustress. The above results taken together indicate that the negative and positive factors were identified as hypothesized, but there was no evidence to suggest that affective, cognitive, and physiological aspects of the stress response represented distinct constructs.

Of the ten items intended to measure distress, six were intended to measure negative cognitive stress response, two were intended to measure negative affective stress response, and two were intended to measure negative physiological stress response. Among the eight items intended to measure eustress, five were intended to measure positive cognitive stress response, and one was intended to measure positive physiological response. In other words, of the 16 items remaining in the two factors, eleven of them were intended to measure cognitive stress response. Because the goal of this scale development effort was to develop a robust measure with a high degree of content validity, the five items intended to measure non-cognitive stress response were eliminated, and we focused only on the cognitive stress response (see Table 5.5). The final scale included eleven items: six items measuring negative cognitive stress response

and five items measuring positive cognitive stress response. These eleven items are referred to as the SRSRQ11.

Table 5.5 - SRSRQ11 Items

Final Scale Selection for SRSRQ11				
Item	Factor		Hypothesized Dimension	Hypothesized Subdimension
	Negative	Positive		
... my thinking is unfocused because of stress at work.	.854		Negative	Cognitive
...pressure at work has hurt my ability to think clearly.	.816		Negative	Cognitive
... stress at work has decreased the quality of my decisions.	.815		Negative	Cognitive
...work stress has decreased my ability to think clearly.	.782		Negative	Cognitive
... work stress has decreased my ability to think.	.763		Negative	Cognitive
...work stress has caused me to lose focus on my work.	.754		Negative	Cognitive
... I have been able to think better because of pressure at work.		.816	Positive	Cognitive
...work stress has helped me accomplish thinking tasks at work.		.807	Positive	Cognitive
...work stress has helped me think clearly		.795	Positive	Cognitive
...my ability to think has been improved by work stress.		.781	Positive	Cognitive
...pressure at work has helped me focus on my work.		.760	Positive	Cognitive
... pressure at work makes me agitated.	.791		Negative	Affective
... stress at work has made me feel physically weak.	.779		Negative	Physiological
... pressure at work has made me feel miserable.	.768		Negative	Affective
... stress at work has decreased my physical performance.	.763		Negative	Physiological
...work stress has helped me to accomplish physical tasks at work.		.754	Positive	Physiological

5.1.3.3 Reliability of the SRSRQ11

Each dimension of the SRSRQ11 was subjected to a reliability analysis. The six items measuring negative cognitive stress response produced a Cronbach's alpha of 0.93. The six items measuring positive cognitive stress response produced a Cronbach's alpha of 0.91. Both are well above the conventional cutoff of 0.70, indicating high internal consistency.

5.1.3.4 Convergent and Discriminant Validity

Evidence for construct validity can be provided by demonstrating convergent and discriminant validity. To assess convergent validity, five scales (enumerated above) from the literature were selected that measured related constructs. A second set of five scales were selected to assess discriminant validity. Pearson bivariate correlations were

computed for each of the comparison scales with the two SRSRQ subscales. Table 5.6 contains number of items, descriptive statistics, Cronbach's alphas (in parentheses on the diagonal) and correlations.

Because the literature review revealed no scales that purported to measure eustress and distress, no scale was hypothesized to reflect the same constructs as the SRSRQ11. Four scales were expected provide some evidence of convergent validity given they represented stress measures. The only stress scale which purports to measure positive consequences associated with stressors is the [Academic] Eustress scale. The Positive Cognitive Stress Response subscale scale was more correlated ($r=0.38$) with [Academic] Eustress Scale than any other comparison scale; as expected the scale correlation was positive. Negative Cognitive Stress Response was positively correlated with Perceived Stress ($r=0.37$) and Neuroticism ($r=0.40$) as expected providing evidence that the subscale is related to other measures that should relate to negative cognitions. On the other hand, Negative Cognitive Stress Response was negatively correlated with [Academic] Eustress ($r=-0.31$) and Proactive Coping ($r=-0.26$), two scales which seek to measure positive aspects of stress. These analyses provide evidence of convergent validity for the two subscales of the SRSRQ11.

Table 5.6 also contains information supporting the discriminant validity of the SRSRQ subscales. Openness, Conscientiousness, and Extroversion (Soto & John, 2009), and the Satisfaction with Life Scale (Diener, et al., 1985) were expected to have low correlation with the stress response scales. Openness, conscientiousness, and extroversion are personality constructs. None has been theoretically linked to stress

Table 5.6
Scale Descriptive Statistics, Reliability, and Correlation

	# Items	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Negative Cognitive Stress Response	6	2.43	1.02	(0.93)									
2. Positive Cognitive Stress Response	5	2.91	1.00	-.22 ***	(0.91)								
3. [Academic] Eustress	10	3.32	.54	-.33 ***	.38 ***	(0.81)							
4. Perceived Stress	10	3.07	.47	.37 ***	-.15 **	-.28 ***	(0.64)						
5. Proactive Coping	14	3.12	.42	-.26 ***	.23 ***	.30 ***	-.27 ***	(0.86)					
6. Neuroticism	6	2.69	.76	.40 ***	-.15 **	-.31 ***	.53 ***	-.36 ***	(0.75)				
7. Openness	8	3.50	.56	-.09 †	.18 **	.22 ***	-.10 *	.40 ***	-.20 ***	(0.65)			
8. Conscientiousness	7	3.61	.65	-.19 ***	.18 **	.20 ***	-.22 ***	.46 ***	-.38 ***	.14 **	(0.73)		
9. Extroversion	7	3.25	.79	-.12 *	.09 †	.18 **	-.17 **	.37 ***	-.26 ***	.23 ***	.20 ***	(0.81)	
10. Satisfaction with Life	5	4.62	1.30	-.16 **	.22 ***	.24 ***	-.39 ***	.37 ***	-.36 ***	.16 **	.32 ***	.30 ***	(0.88)

† p ≤ 0.10

* p ≤ 0.05

** p ≤ 0.01

*** p ≤ 0.001

response, and none have items that are intended to reflect stress-related constructs. Similarly, life satisfaction is theoretically distinct from stress response. All four of the scales did, in fact, have lower correlations than the stress-related comparison scales. Correlations with the non-stress related scales ranged from 0.09 to 0.19 for negative cognitive stress response and from 0.09 to 0.22 for positive cognitive stress response. Though the current literature provides no current guidance on the threshold for discriminant validity, the classic threshold of 0.80 (Campbell & Fiske, 1959) is never approached. The low level of correlation between the comparison scales and the SRSRQ11 subscales provide evidence of discriminant validity.

Though this initial scale development procedure resulted in scales which reflect only positive and distress rather than the six dimensions intended, there is strong evidence to support the content validity, internal consistency, convergent validity, and discriminant validity of the two positive and negative subscales of the SRSRQ11. As such, this scale is appropriate for use as the operationalization of positive and distress in the subsequent sections of this paper.

5.2. Hypotheses Testing

This study sought to empirically test eleven discrete hypotheses. Table 5.7 summarizes the hypotheses. All data collected in the four studies was collected via online surveys. Participants responded either at work from designated survey computers or from their own computers via a dedicated web link. All participants were given a discrete seven digit code to ensure that only assigned participants responded to the surveys and to enable data to be matched across studies. There was a firewall between

Table 5.7 - Hypotheses Summary

Hypothesis	Independent Variable	Dependent Variable	Moderator	Predicted Relationship
1	Challenge Stressor	Positive Stress Response	-	positive relationship
2	Hindrance Stressor	Negative Stress Response	-	positive relationship
3	Psychological Capital Training Treatment	Psychological Capital	-	Increase among treatment group; no change in wait list control group
4	Challenge Stressor	Positive Stress Response	Psychological Capital	Psychological Capital would enhance positive relationship
5	Hindrance Stressor	Negative Stress Response	Psychological Capital	Psychological Capital would ameliorate negative relationship
6a	Positive Stress Response	Performance	-	positive relationship
6b	Positive Stress Response	Well Being	-	positive relationship
6c	Positive Stress Response	Health	-	positive relationship
7a	Negative Stress Response	Performance	-	negative relationship
7b	Negative Stress Response	Well Being	-	negative relationship
7c	Negative Stress Response	Health	-	negative relationship

the codes and the participants' names to protect the anonymity of survey responses.

Participants were not aware of the hypotheses being tested. Data was collected over a five week period.

5.2.1 Sample

At the time the study commenced, there were 102 employees at the Company. Prior to the pretest (Survey 1), 51 employees were assigned to the treatment group and 51 employees were assigned to the wait list control group. Two of the employees randomly assigned to the treatment group were out on medical leave and were reassigned to the wait list control group. Thus, there were 49 employees assigned to the treatment group and 53 employees assigned to the waitlist control group. During the course of the research, seven employees left the organization and were omitted. This left 91

participants in the research, 43 assigned to the treatment group and 48 assigned to the control wait list group.

Of the 91 total participants, 89 participated (response rate = 97.8%) in survey one, 91 participated (response rate = 100%) in surveys two and three, and all 12 supervisors at the Company participated (response rate = 100%) in survey four. Demographic data was collected from human resources records. Sixty-four of the respondents (70.3%) were white, 15 (16.5%) were black or African-American, five (5.5%) were Hispanic or Latino, and there were seven (7.7%) for whom no data was available. The Company employs more women than men; 52 respondents were women (57.1%), 36 respondents were men (39.6%), and there was no data for three respondents (3.3%). The average age among the respondents was 45 years old (SD=14.4), with age ranging from 21 to 73 years old.

5.2.2 Descriptive Statistics and Correlations

Correlations were run on all model variables and age. Age was included in the correlation analysis because it has been empirically connected with model variables, e.g. health. Descriptive statistics, correlations, and reliabilities are summarized on Table 5.8. Age was correlated with several variables. Age was positively correlated ($r=0.15$, $p<0.05$) with supervisor reported performance. Additionally, age was negatively correlated ($r=-0.228$, $p<0.05$) with, distress. Because of the relationship between age and these two variables of interest, all regression analyses included age as a covariate.

5.2.3. Challenge Stressors and Positive Stress

Hypothesis 1 predicted a positive relationship between challenge stressors and eustress. Age was included as a covariate in the regression. Table 5.9 contains a

Table 5.8

Descriptive Statistics, Correlations, and Scale Reliabilities

	mean	standard deviation	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	45.00	14.45	na												
2. Challenge Stressors	2.68	1.00	-0.10	(0.86)											
3. Hindrance Stressors	2.15	.89	-0.03	0.46 ***	(0.78)										
4. Positive Stress Response	3.13	1.03	0.12	-0.27 *	-0.18 †	(0.89)									
5. Negative Stress Response	2.17	.98	-0.24 *	0.41 ***	0.36 **	-0.31	(0.89)								
6. Psychological Capital	4.98	.50	0.17	-0.09	-0.21 †	0.28	-0.34 **	(0.89)							
7. Performance	6.05	1.33	0.26 *	-0.01	-0.23 *	-0.07	-0.19 †	0.16	(0.95)						
8. Well Being 1	4.06	.61	0.13	-0.25 *	-0.38 ***	0.31 **	-0.55 ***	0.48 ***	0.19 †	(0.93)					
9. Well Being 2	3.79	.77	0.06	-0.22 *	-0.27 *	0.34 **	-0.50 ***	0.48 ***	0.20 †	0.82 ***	(0.93)				
10. Physical Health	52.12	10.66	0.02	-0.21 †	-0.19 †	0.06	-0.31 **	0.23 *	0.19 †	0.37 **	0.36 **	na			
11. Mental Health	45.34	7.34	0.01	-0.09	0.13	0.01	-0.27 *	0.12	-0.01	0.19 †	0.21 †	0.11	na		
12. Headaches	1.34	.66	-0.09	0.22 *	0.40 ***	-0.06	0.40 ***	-0.12	-0.14	-0.37 **	-0.20 †	-0.38 **	0.07	(0.98)	
13. Muscular Skeletal Pain	60.67	29.30	-0.03	0.23 *	0.35 **	-0.03	0.39 ***	-0.10	-0.31 **	-0.36 **	-0.35 **	-0.59 ***	0.01	0.43 ***	na

Cronbach's α in parentheses on diagonal

† p ≤ 0.10

* p ≤ 0.05

** p ≤ 0.01

*** p ≤ 0.001

Table 5.9 - Regression Analysis, Hypothesis 1

The effect of challenge stressors on positive stress response.		
Variables	Hypothesis 1	
	Positive Cognitive Stress Response	Positive Cognitive Stress Response
Age	0.11	0.08
Challenge Stressors		-0.25*
Overall Model R^2		0.05
Adjusted R^2	0.00	0.05
Change in R^2		
F for change		4.95*
Overall F	.93	2.97†

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

summary of the regression analysis. Results indicated that challenge stressors significantly predicted a decrease ($\beta = -0.25$, $p < 0.05$) in eustress. Challenge stressors accounted for an additional 5% ($\Delta R^2 = 0.05$) of the variance in eustress above the effect of age. Thus, Hypothesis 1 was not supported.

5.2.4. Hindrance Stressors and Negative Stress

Hypothesis 2 stated that hindrance stressors would be positively related to distress. Age was included as a covariate in the regression. Table 5.10 contains a summary of the regression analysis. Hindrance stressors were related to increased

Table 5.10 - Regression Analysis, Hypothesis 2

The effect of hindrance stressors on negative stress response.		
Variables	Hypothesis 2	
	Negative Cognitive Stress Response	Negative Cognitive Stress Response
Age	-0.23	-0.21
Hindrance Stressors		0.32**
Overall Model R^2	0.04	.14
Adjusted R^2		.14
Change in R^2		.10
F for change		9.5**
Overall F	4.20*	7.08**

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

distress ($\beta=0.32$, $p<0.01$), accounting for approximately 10% ($\Delta R^2=0.10$) of the variance in distress above the effect of age. Thus, Hypothesis 2 was supported.

5.2.5. Effectiveness of Psychological Capital Training

Hypothesis 3 predicted that the Psychological Capital Training (PCT) program implemented at the Company would increase the psychological capital among those treated. The PCT was conducted as described in Chapter 4. There were 42 employees who received PCT and 49 in the control group. Table 5.11 contains variable means, standard deviation, and variance for psychological capital by treatment and control group.

Table 5.11 - Between Group Differences, Hypothesis 3

Statistical Comparison by Group		
	Psychological Capital (Pretest)	Psychological Capital (Post test)
Treatment	Mean	4.90
	SD	.63
	Variance	.40
Control	Mean	5.10
	SD	.47
	Variance	.22
Total	Mean	5.00
	SD	.56
	Variance	.32

The pretest for psychological capital among the control group gave a mean of 4.90. The posttest of psychological capital among the treatment group had a mean of 4.96. Thus, the mean of the treatment group increased by 0.06 from pretest to posttest. During the same period of time, the control group decreased from a mean of 5.10 to 5.00. Although the mean of the treatment group did increase in the hypothesized direction, the change between the pretest and the post was not statistically significant. Therefore, there is no evidence to support Hypothesis 3.

5.2.6 Psychological Capital as a Moderator of the Relationship between Challenge Stressors and Eustress

Hypothesis 4 predicted that psychological capital would moderate the relationship between challenge stressors and the eustress. Following the procedure recommended by Aiken and West (1991), moderated multiple regression analyses were performed to test Hypothesis 4. A moderated regression was conducted entering the following variables in

this order: age (covariate), challenge stressors, psychological capital, and the challenge stress by psychological capital interaction variable. A summary of the regression results for Hypotheses 4 can be found in Table 5.12. Results demonstrate that age was not a significant predictor of eustress. Psychological capital was a unique predictor ($\beta=0.30$, $p<0.01$, $\Delta R^2=0.13$) of eustress, above the effects of age and challenge stressors.

However, the interaction variable was not a significant predictor of eustress. Thus, there is no evidence to support Hypothesis 4.

5.2.7 Psychological Capital as a Moderator of the Relationship between Hindrance Stressors and Distress

Hypothesis 5 predicted that psychological capital would moderate the relationship between hindrance stressors and the distress. Following the procedure recommended by Aiken and West (1991), moderated regression analyses were performed to test Hypothesis 5. Age was entered in step 1, hindrance stressors was entered in step 2, psychological capital was entered in step 3, and the interaction was entered in step 4. A summary of the regression results for Hypotheses 5 can be found in Table 5.13. Results indicated that age was negatively related to distress ($\beta=-0.23$, $p<0.05$, $R^2=0.04$). In addition, hindrance stressors were related to more distress ($\beta=0.31$, $p<0.01$, $\Delta R^2=0.08$). Those with more psychological capital had less distress ($\beta=-0.24$, $p<0.05$, $\Delta R^2=0.05$). However, the interaction variable was not a significant predictor of distress. Thus, there is no evidence to support Hypothesis 5.

Table 5.12 - Regression Analysis, Hypothesis 4

Hypothesis 4				
Variables	Positive Stress Response	Positive Stress Response	Positive Stress Response	Positive Stress Response
Age	0.11	0.08	0.04	0.04
Challenge Stressors		-0.25*	-0.23*	1.16
Psychological Capital			0.30**	0.71
Psychological Capital X Challenge Stressors				-1.42
Overall Model R^2		0.05	.13	.14
Adjusted R^2	0.00	0.05	.13	.14
Change in R^2		0.05	.08	.01
F for change		4.87*	7.31**	2.01
Overall F	0.90	2.91†	4.54**	3.96**

† $p \leq 0.10$
* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

Table 5.13 - Regression Analysis, Hypothesis 5

Hypothesis 5				
Variables	Negative Cognitive Stress Response			
Age	-0.23*	-0.21†	-0.16	-0.15
Hindrance Stressors		.31**	.26*	-0.22
Psychological Capital			-0.24*	-0.37
Psychological Capital X Hindrance Stressors				0.47
Overall Model R^2		0.12	0.17	0.16
Adjusted R^2	.04	0.12	0.17	0.16
Change in R^2		0.08	0.05	-0.01
F for change		8.16**	4.96*	.162
Overall F	4.158*	5.43**	4.96**	3.75**

† $p \leq 0.10$
* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

5.2.8 Stress Response and Individual Outcomes

5.2.8.1 Performance

Hypothesis 6a predicted that eustress would be positively related to performance.

Hypothesis 7a predicted that distress would be negatively related to performance. In order to test these hypotheses, a hierarchical linear regression was performed entering the covariate age followed by the independent variables, eustress and distress. See Table 5.14. Results of the hierarchical regression analysis indicated that older workers had

Table 5.14 - Regression Analysis, Hypotheses 6a and 7a

Hypothesis 6a and 7a, Effect of Stress Response on Performance			
Variables	Performance	Performance	Performance
Age	0.31**	0.32**	0.28*
Positive Stress Response		-0.10	-0.16
Negative Stress Response			-0.21†
Overall Model R^2		0.08	0.11
Adjusted R^2	0.08	0.08	0.11
Change in R^2		0.00	0.03
F for change		0.80	3.27†
Overall F	7.65**	4.21*	3.99*

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

higher performance ($\beta=0.31$, $p<0.01$). Age accounted for approximately 8% (adjusted $R^2=0.03$) of the variance in performance. Additionally, there was no relationship between eustress and performance. However, there was a non-significant trend such that those with more distress had lower performance ($\beta=-0.21$, $p<0.10$). Distress accounted for a

3% ($\Delta R^2=0.03$) of the increment in the variance of performance above the effects of age and eustress. Thus, the results of this hierarchical regression analysis provide no evidence to support Hypothesis 6a and weak evidence to support Hypothesis 7a.

5.2.8.2 Well Being

Hypothesis 6b predicted that eustress would be positively related to well being. Hypothesis 7b predicted that distress would be negatively related to well being. Two separate dependent variables were chosen to operationalize well being: the PANAS positive affect scale (Watson, Clark, & Tellegen, 1988) and the Wright Well-being Indicator (Wright & Huang, 2009). Two hierarchical regression analyses were performed with the covariate age entered before the independent variables, eustress and distress. See Table 5.15 for a summary of results.

Table 5.15 - Regression Analysis, Hypotheses 6b and 7b

Hypothesis 6b and 7b, Effect of Stress Response on Well Being						
Variables	Well Being 1	Well Being 1	Well Being 1	Well Being 2	Well Being 2	Well Being 2
Age	0.10	0.06	-0.02	0.18	0.14	0.05
Positive Stress Response		0.33**	0.21*		0.29*	.16
Negative Stress Response		-0.44***	-0.44***			-0.50***
Overall Model R^2		0.09	0.25		0.09	0.30
Adjusted R^2	-	0.09	0.25	0.02	0.09	0.30
Change in R^2		0.09	0.16		0.07	0.23
F for change		8.72**	16.54***		5.82*	21.20***
Overall F	.75	4.78*	9.387***	2.23	4.10*	10.65***

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

The first hierarchical regression analysis used the PANAS positive affect scale. Results indicated that age was not significantly related to well being. Results also indicated that eustress predicted an increase ($\beta=0.21$, $p<0.05$) in well being and distress predicted a decrease in well being ($\beta=-0.44$, $p<0.001$). In the full model, eustress and distress accounted for 25% (overall model $R^2=0.25$) of the observed variance in well positive affect above the effects of age. The hierarchical analysis indicated that approximately 16% ($\Delta R^2=0.16$) of the variance could be attributed to distress and 9% ($\Delta R^2=0.09$) of the variance attributed to eustress.

The second hierarchical regression analysis used the Wright Well Being Indicator to operationalize well being. Age was not a significant predictor of well being. Eustress was a significant predictor of an increase ($\beta=0.29$, $p<0.05$) in well being and accounted for approximately 7% ($\Delta R^2=0.07$) of the observed variance in well being. Results of the full regression model indicate that distress predicted a decrease ($\beta=-0.50$, $p<0.001$) in well being and accounted for approximately 23% ($\Delta R^2=0.23$) of the variance in well being above the effects of age and eustress. Taking into account the results of both analyses there is some evidence to support Hypothesis 6b. On the other hand, both analyses provided strong support for Hypothesis 7b.

5.2.8.3 Health

Hypothesis 6c predicted that eustress would be positively related to individual health. Hypothesis 7c predicted that distress would be negatively related to individual health. Four separate dependent variables were chosen to operationalize health, a physical

health scale, a mental health scale, a headache frequency and intensity scale, and a muscular-skeletal pain scale. Age was included in all the analyses as a covariate. Four hierarchical regression analyses were performed, one with each operationalization of individual health. In each of the analyses, the dependent variable was regressed on age, eustress, and distress. Table 5.16 contains a summary of the regression results for Hypotheses 6c and 7c.

The first hierarchical analysis used physical health as the dependent variable. Neither age nor eustress were significant predictors of physical health, however distress significantly predicted ($\beta=-0.38$, $p<0.01$) a decrease in physical health. Distress accounted for approximately 8% ($\Delta R^2=0.08$) of the observed variance in physical health, above the effects of age and eustress.

A second hierarchical regression analysis used mental health as the dependent variable. Neither age nor eustress were significant predictors of mental health. However, distress significantly predicted a decrease ($\beta=-0.31$, $p<0.05$) in mental health. Distress accounted for 5% ($\Delta R^2=0.05$) of the observed variance in mental health, above the effects of age and eustress.

A third hierarchical analysis used headache as the dependent variable. Neither age nor eustress were significant predictors of headaches, but there was a significant positive relationship ($\beta=0.41$, $p<0.01$) between distress and headaches. Distress accounted for 12% ($\Delta R^2=0.12$) of the observed variance in headaches, above the effects of age and eustress.

Table 5.16 - Regression Analysis, Hypotheses 6c and 7c

Hypothesis 6c and 7c, Effect of Stress Response on Physical Health and Mental Health

Variables	Physical Health	Physical Health	Physical Health	Mental Health	Mental Health	Mental Health
Age	-0.01	-0.02	-0.11	0.04	0.04	-0.01
Positive Stress Response		0.02	-0.07		-0.01	-0.10
Negative Stress Response			-0.38**			-0.31*
Overall Model R^2		-	0.08		-	0.05
Adjusted R^2	-	-	0.08	-	-	0.05
Change in R^2		-	0.08		-	0.05
F for change		0.03	9.46**		0.13	6.46*
Overall F	0.01	0.02	3.17*	0.11	0.06	2.19†

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

Table 5.17 - Regression Analysis, Hypotheses 6c and 7c

Hypothesis 6c and 7c, Effect of Stress Response on Headache and Muscular-skeletal Pain

Variables	Headache	Headache	Headache	Muscular-skeletal Pain	Muscular-skeletal Pain	Muscular-skeletal Pain
Age	-0.07	-0.07	-0.00	-0.01	-0.01	0.08
Positive Stress Response		-0.04	0.08		-0.04	0.08
Negative Stress Response			.41**			.45***
Overall Model R^2		-	0.12		-	0.14
Adjusted R^2	-	-	0.12	-	-	0.14
Change in R^2		-	0.12		-	0.14
F for change		.09	11.75**		0.10	15.25***
Overall F	0.35	0.21	4.08*	0.01	.06	5.13**

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

The fourth and final hierarchical regression analysis provided further confirmatory results. In this hierarchical analysis, the dependent variable was on muscular-skeletal pain. Neither age nor eustress was a significant predictor of muscular-skeletal pain, but distress significantly predicted ($\beta=0.45$, $p<0.001$) an increase in muscular-skeletal pain. Distress accounted for approximately 14% ($\Delta R^2=0.14$) of the observed variance in muscular-skeletal pain, above the effects of age and eustress. Similar to headaches, an increase in muscular-skeletal pain is a decrease in health. The four analyses taken together provide no evidence to support Hypothesis 6c. However Hypothesis 7c received support across the four operationalizations of health, therefore there is strong evidence to support Hypothesis 7c.

CHAPTER 6

DISCUSSION

The central themes running through this dissertation are that stress within organizations is ubiquitous and of a varying nature, that individuals respond to different stressors depending upon their own strengths and tendencies, and that the stress response predicts a variety of outcomes important to both individuals and organizations. The literature review, model development, and empirical results presented in the previous chapters explore these themes and seek to present and test a framework for understanding these themes. The purpose of this chapter is to provide the reader with an interpretive discussion of the results and contributions of this study. Because this chapter is interpretive, its purpose is to offer explanations rather than to present facts.

This chapter seeks to accomplish five tasks. First, the empirical results will be systematically addressed. Second, the contributions of this study to the management literature and to management practitioners will be presented. Third, a discussion of some of the limitations of this study will be addressed. Fourth, opportunities for future research will be proposed. Finally, brief concluding remarks regarding this study's fulfillment of its original purpose are offered.

6.1 Interpretation of Results

This section systematically discusses the empirical results of this study.” First, a discussion of psychological capital as a moderator will be presented. Second, there will be a discussion of the Psychological Capital Training intervention. The findings regarding the stress response scale developed in this study will be explored in the third part of this section. Finally, the hypotheses relating to synthetic model of organizational stress will be discussed.

6.1.1 Psychological Capital as a Moderator

Hypotheses 4 and 5 suggested that psychological capital would moderate the relationships between stressors and the stress response. No statistical evidence was found to support these proposed interactions. Though this was an unexpected and disappointing result, I believe the theoretical basis for these hypotheses remain. Several possibilities exist which may explain the lack of support for these hypotheses. One explanation is the potential selection bias of this sample for this particular variable. The Company is an award winning organization recognized for its positive culture and as a great place to work (Hall, 2011). The mean for psychological capital among all employees was 5.00; psychological capital is measured on a 6 point scale from 1 to 6 (Luthans, et al., 2008). In addition, of all the variables in this study, psychological capital had the lowest standard deviation (0.50) and variance (0.251). This suggests that the Company either through its HR selection process, its existing orientation and training programs, or its unique cultural environment selects for persons with high psychological capital. In cases of significant range reduction or in the presence of a ceiling effect, it is often difficult to establish theoretical relationships through basic statistical tests (Muthén, 1989; Muthén,

1990; Uttl, 2005; Wang, Zhang, McArdle, & Salthouse, 2008). The regression analysis used in this dissertation may not have been sufficient to detect the hypothesized moderation relationships. The planned follow-up investigation at the Company will make additional measures of this hypothesis and additional data. Additionally, more sophisticated statistical techniques may yield different results. All this being said, this study failed to demonstrate the hypothesized moderating effects of psychological capital.

6.1.2 Psychological Capital Training

Perhaps the single most consuming effort concerning this study was the development, production, and execution of the PCT. This effort required a large amount of research, the difficult adaptation of existing intervention materials, the exhaustive search for open-source audio, video, and graphic material, a major script-writing effort, and significant monetary investment in professional voice talent. These efforts culminated in the production of two 45 minute multi-modal audio-visual training modules, a seminar lesson plan, and four fifteen minute "homework" surveys. In order to execute the PCT at the Company, many hours of preparation and coordination were necessary. Without the constant cooperation of senior management of the Company, this would have been impossible.

Despite the huge investment made in PCT, the empirical results suggest that the training was not successful in achieving its hypothesized purpose. There was no statistical evidence to support a significant increase in psychological capital (Hypothesis 3) among those employees who received the training.

Though these initial results are discouraging, I believe the PCT was a worthwhile investment for both this researcher, the participants who received the training, and the

Company that invested many thousands of dollars in this effort. I base this opinion on four factors. First, all the results are not in. A subsequent application of the PCT at the Company among the wait-listed control group will double the sample size and potentially change the significance level of the treatment. Secondly, time-lagged post tests among the original treatment group are scheduled and, again, may demonstrate that the training has had lasting effects over time. Third, the qualitative data generated in Modules 3 - 6 strongly suggest that participants benefitted from the training and used it in their daily lives. Though an analysis of the qualitative data was beyond the scope of this dissertation, a future inquiry using this data set may well prove fruitful. Fourth, and finally, the range reduction/ceiling effect issue mentioned in the previous section may have impacted the statistical analysis used in this study.

6.1.3 Self Report Stress Response Questionnaire

The scale development effort in this study was largely successful, despite the fact that the final scale did not include four of the six conceptual dimensions included in the original prospective scale. The two subscales which were created, SRSRQ negative cognitive and SRSRQ positive cognitive, proved to be robust, reliable measures when field tested at the Company. In addition to the content validity demonstrated in Study 1 and Study 2, and the convergent and discriminant validity demonstrated in Study 3, the fifteen items of the SRSRQ11 demonstrated predictive validity in the primary field study. There was support for a positive and negative domain to stress response and both subscales of the SRSRQ11 functioned as both dependent and independent variables.

The principal shortcoming on the scale development effort was its failure to incorporate all the dimensions of stress response originally intended. The final subscales

purport to measure positive cognitive stress response and negative cognitive stress response. The physiological and affective dimensions of stress response are not measured in this eleven item scale.

Because of the sample size ($n=332$) in Validity Study 3 it is possible that the exploratory factor analyses performed did not identify the six potential dimensions of eustress and distress given the relatively large number of items (48) investigated. However, the scree plot and cumulative variance analyses of the data support the conclusion that there are two major domains (positive and negative) to stress response rather than six (positive affective, positive cognitive, positive physiological, negative affective, negative cognitive, and negative physiological). It is possible that a subsequent two dimension version of the SRSRQ might include items which measure physiological and affective stress response. The final version of the SRSRQ11 omitted five such items in order to produce a more conceptually coherent measure. This conceptual coherence, however, comes at the cost of narrowing the definition of positive and distress to the cognitive domain for those researchers choosing to use this measure.

6.1.4 Synthetic Stress Response Model

This study's conceptual model synthesized elements of Lazarus & Folkman's (1984) Transactional Model, Quick's et al. (1997) Theory of Preventive Stress Management, and Cavanaugh's et al. (2000) Challenge Hindrance Framework. This study proposed eight hypotheses specifically related to the central, horizontal portion of this framework. Specifically this study sought to demonstrate that different types of stressors (challenge or hindrance) tend to produce different types of stress response (eustress or distress), and these stress responses produce differing individual outcomes.

Central to measuring this model was creating a survey scale capable of measuring the individual stress response. As discussed in the previous section, the SRSRQ11 produced scales capable of validly measuring the positive cognitive stress response and the negative cognitive stress response. Thus, the scale development effort enabled the testing of the synthetic model. The results presented in Chapter 5, taken as a whole, lend partial support to this theoretical model. As a result of this study, there is now evidence that hindrance stressors generate distress.

Hypotheses 6a, 6b, and 6c concern the eustress as a predictor of individual outcomes. The results of these three hypotheses were mixed. There was no statistical support for the hypothesis (6a) that eustress increased performance. There was support for the positive relationship between eustress and well-being (Hypothesis 6b). Two independent measures of well-being produced supportive results for this conclusion. Hypothesis 6c concerning the positive relationship between eustress and health received no support.

Negative cognitive stress response served as an independent variable for Hypotheses 7a, 7b, and 7c. The empirical results of these three tests were on the whole affirmative. Though negative cognitive stress response failed to predict a decrease in performance, it served as a reliable predictor of decreased well-being across two independent measures and decreased health across four measures.

In the context of the synthetic model, there was some evidence that positive stress predicts positive individual outcomes and strong evidence that distress predicts negative individual outcomes. These results, then, provide evidence to support the synthetic

model and the Theory of Preventive Stress Management. In addition, these results suggest a mechanism by which stressors produce individual outcomes.

Because the SRSRQ11 only measures the cognitive domain, the significance of these results is heightened. Because the affective and physiological stress response domains were not measured, the impact on individual outcomes due to stress response is minimized rather than maximized. Subsequent measures of stress response which include the affective and physiological domains may be expected to produce even more dramatic results.

Finally, the results of Hypothesis 7c, negative cognitive stress response decreases health, are in themselves an important new empirical finding. Given that three of the health measures are designed to measure somatic health, it is important to emphasize that this study provides evidence that cognitive stress produces somatic consequences.

6.2 Contribution

One of the central purposes of any dissertation is to make contributions to the state of knowledge or practice in a given field. In the following section, this study's contributions to both theory and practice will be discussed. Several contributions to the behavioral and organizational literature will be presented. Next, two recommendations based upon the findings of this research will be offered for management practitioners.

6.2.1 Contributions to the Literature

One potential opportunity provided by this study was to further investigate the CHF. The results from this empirical study are mixed. There was no evidence of a positive relationship between challenge stressors and eustress. On the other hand, strong support for the framework was provided by the results regarding the relationship

between hindrance stressors and the distress. The challenge and hindrance results taken together provide limited support for the CHF. Consistent with much of the broader stress literature, positive stress continues to be more difficult to demonstrate than negative stress (Quick, et al., 1997).

Another goal of this study was to examine psychological capital as a potential moderator of the relationship between stressors and stress response. Given the negative results with challenge stressors, no meaningful analysis was possible with regard to the challenge stressor to eustress relationship. With regard to the hindrance stressors to distress, an analysis was more determinative. Though the direct effect of psychological capital decreased distress as hypothesized, no evidence for an interactive effect was discovered. Though the moderation hypotheses were not supported, the results showing a main effect of psychological capital on distress supports the findings of Avey et al. (2009) using another conceptual measure of individual stress.

The use of the SRSRQ11 enabled the construct of stress response to be measured for the first time. The measure itself is a significant, useful contribution to the literature. As the measure continues to develop and improve it will enable theories to be tested and previous studies using less conceptually consistent measures of stress response to be reevaluated. The factor analyses used to develop the SRSRQ11 provide strong evidence for two different kinds of stress response, a positive and a negative path. Positive stress has been difficult to demonstrate empirically over the past five decades (Nelson & Simmons, 2011; Quick, et al., 2013). Though stress has been empirically connected to positive emotional states (Quick, et al., 1997; Podsakoff, 2007; Quick, et al., 2013), there

have been no studies to date that have measured the impact of eustress and distress on well-being. This study makes two contributions to the understanding of this relationship. First, empirical evidence was found supporting a positive relationship between positive cognitive stress and well-being. Because positive stress findings have been difficult to demonstrate, this particular finding involving positive cognitive stress is an important step forward. The second contribution concerns the negative relationship between distress and well-being. Though many studies have related coping (Edwards, 1992; Van der Doef & Maes, 1999; Folkman & Moskowitz, 2000; Gross & John, 2003) and burnout (Maslach, Schaufeli, & Leiter, 2001; Dunn, Iglewicz, & Moutier, 2008) to negative emotional states, this study is the first to demonstrate that distress decreases well-being.

A serendipitous finding in this work concerns the positive effect of age on negative cognitive stress response. Because stress response has received so little empirical attention, this interesting finding had not been previously investigated. The idea that older people respond to stress less negatively is fascinating. Perhaps some new advantages of maturity have been uncovered. The underlying relationship between age and stress response is intriguing. Whether this effect is related to living well, wisdom, mastery, or other factors is a matter for future investigation.

As this study was being planned over the past two years, measuring health outcomes associated with stress was always an important goal. With the increasing focus on organizational wellness and positive organizational behavior (Karasek & Theorell, 1990; Bennett, Patterson, Reynolds, Wiitala, & Lehman, 2004; Quick & Quick, 2004; Avey, et al., 2008; Wright & Quick, 2009; Bennett, Broome, Pilley, & Gilmore, 2011),

this study sought to contribute to the understanding of the relationship between workplace stressors and health consequences. The findings in this study demonstrating the clearly negative impact that negative cognitive stress response has on self report measures of health make a contribution to the wellness literature. These results showed that negative cognitive stress response led to an increase in self reported headaches and muscular-skeletal pain. In addition, the results provided evidence that overall physical health and overall mental health decreased as a result of distress. Four measures, four consistent findings - this study makes the case for minimizing negative stress in order to create healthier organizations even stronger.

6.2.2 Contributions to the Profession of Management

This study also provides meaningful guidance to practitioners in our field. This study provides management professionals with two central recommendations. First, this study provides strong evidence that negative stress leads to negative health consequences. Managers wishing to build positive, healthy organizations must be cognizant of the harmful impact of distress on their employees. Employee absenteeism and health insurance are bottom line issues with every business. Managing stress response is not just a soft, HR, touchy-feely issue. Poor employee health costs businesses money. Managers wishing to be good stewards or good people should care about managing employee stress response.

The second closely related recommendation concerns the type of stressors which managers choose to expose to their employees. Because this study provides some support to the Challenge Hindrance Framework, managers should be careful to minimize those stressors which employees appraise as contrary to their interests. The CHF

suggests, and this study supports, that employees tolerate stressors best if they are able to relate that stressor to a constructive organizational or individual outcome. It is impossible and ill-advised for a manager to remove all sources of stress from his or her workplace. It is crucial, on the other hand, to attempt to relate inevitable stressors to meaningful and positive outcomes.

6.3 Limitations of this Study

Like all empirical studies, this study contains limitations of which the reader should be aware. In this section, a number of limitations in this work will be enumerated. First, a discussion of limitations related to the sample will be discussed. Second, problems with the survey methodology will be addressed. Finally, a number of limitations concerning the analysis of the data will be presented.

The sample in the primary study presents several limitations. First, all respondents were employed in one Company located in one geographic region. Though this is common in organizational research, the limitations of this sampling procedure should be made explicit. The generalizability of these results may be questionable across different organizations, different industries, or different geographical regions. Also, because the Company was recognized as an excellent place to work due to its positive culture, the generalizability of results may be problematic. Another limitation of this sample is its relatively small size. Though the response rate was excellent, all hypotheses tests are based on findings from fewer than 100 individuals. This study might have been improved by employing a larger sample of workers across several organizations and geographic regions.

Many employees taking the surveys at the Company did not have internet access at their desks. This resulted in a potential methodological limitation in this work. Because some respondents received the treatment and took the survey at their desks, some took it from home, and some took it from a designated survey computer at work, the location and timing of the surveys varied systematically by employee classification. The employees who received the treatment and took the survey on designated survey machines were required to schedule their computer time with a supervisor. Though no respondents made any comments with regard to pressure from their supervisors, the supervisor to subordinate interaction connected with scheduling machine time is systematically different than receiving the treatment or taking the survey at your leisure from your desk or at home. This introduced a possible alternative source of systematic variation in the study. A preferable methodology would have required all employees of the company to receive the treatment and take the surveys under the same conditions. In order to accommodate the operational needs of the Company, this was not possible.

Another potential methodological problem with this study is common methods bias. In this study, most of the constructs were tested with self-report measures; therefore, in most cases, the same respondent generated data for both independent and dependent variables. Several methodological techniques were used to minimize common methods bias. Independent variables and dependent variables were never measured on the same questionnaire, and independent variable and dependent variables were measured at different times separated by as much as five weeks. Despite these efforts, it is possible that common methods bias detracts from the methodological rigor of the study.

Finally, the analysis of the data gathered in this study has several limitations. First, a great deal of qualitative data and dosage data was gathered during the treatment and was not analyzed in this study. It is possible that adding the analysis of this data into the study would change the results with regard to the effectiveness of the PCT. Second, no confirmatory factor analysis (CFA) was performed during the scale development effort. A CFA has the potential to demonstrate fit and lack of fit between the items and the latent constructs investigated in that effort. Third, and finally, the synthetic model implies a mediating role for stress response between stressors and outcomes. This mediating role was not analyzed in this study.

6.4 Opportunities for Future Research

The results of this study lead future researchers with three significant opportunities. First, because there was no evidence to support the hypothesis that a multimodal intervention program could increase individual psychological capital, the opportunity to develop and test such an intervention remains. The results of this study indicate that testing samples should be sought that have a substantial amount of variance in psychological capital before the treatment.

Second, this study presents opportunities for the further development and testing of two new scales of interest to stress scholars. Though the SRSRQ11 was used successfully in the field to measure stress response hypotheses, the scale in its current configuration only measures the cognitive domain of eustress and distress. Further scale development research is warranted to attempt to develop a measure which might also encompass the affective and physiological domains of stress response. Another

opportunity involves Podsakoff's (2007) Challenge Hindrance Scale. In this study, the Hindrance subscale was more effective than the Challenge subscale. Further exploration into the predictive quality and psychometric properties of this scale are warranted.

The third significant opportunity for future researchers presented by this study involves testing the relationship between stress response and numerous variables of interest to organizational scholars. The TPSM (Quick, et al., 1997) has been a highly regarded comprehensive model of organizational stress. One of the criticisms of this model has been the relatively few studies that have empirically demonstrated its framework (Hargrove, et al., 2011). The development of the SRSRQ11 now enables many of the TPSM hypotheses to be tested. For example, what is the effect of stress response on various coping behaviors? What is the impact of positive and distress on workplace behaviors such as turnover, counterproductive behavior, and citizenship behavior? Similarly, the TPSM suggests individual moderators of stress response and proposes stress response as a mediator between stressors and outcomes (Quick, et al., 1997; Quick, Quick, & Nelson, 1998; Hargrove, et al., 2011; Quick, et al., 2013). Having a scale to measure stress response presents fruitful opportunities for those wishing to investigate organizational stress using the TPSM.

6.5 Conclusion

In the introduction of this paper, four problems were defined. This paper sought to systematically address these problems. The first problem concerned the lack of an effective measurement tool to explore individual stress response. The results of this study provide good evidence that the SRSRQ11 may well be a potential solution to this

problem. The SRSRQ11 functioned in the field as both a dependent and an independent variable measuring individual stress response. This scale, or future versions of it, has a great potential for testing a variety of empirical questions.

The second problem concerned the existing state of psychological capital interventions. Prior to this study, no multimodal intervention using best practices from the stress prevention literature existed to develop psychological capital. As a result of this study, such an intervention, the PCT, has now been developed. Though its initial implementation in the field generated no evidence of an increase in psychological capital, it is likely that as the program is refined and implemented in suitable organizations it will develop into a useful management intervention. PCT has the potential to change people's lives for the better and make for happier and healthier organizations.

The third problem presented in the introduction concerned the testing of the Challenge Hindrance Framework. This effort was specifically encouraged by Avey et al. (2009). This study accomplished this examination and found mixed support for the CHF. This study showed unequivocal support for the positive relationship between hindrance stressors and a distress. The mechanism by which challenge stressors produce positive outcomes is deserving of continued attention.

Finally, this study addressed the problem of the uncertainty of the relationships between stress response and outcomes. This study clearly demonstrated the potentially destructive nature of distress on employee well-being and health. Additionally, this study gives us a glimmer of the potential constructive nature of eustress. This study demonstrated that stress response matters. It matters because it in part determines how

people function and feel in the organizations in which they work. Taken as a whole, this study reinforces the necessity for taking workplace stress seriously as an important piece of organizational health.

REFERENCES

- Aiken, L. S., & West, S. G. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.
- Aquino, K., & Reed, A., II. (2002). Self-importance of moral identity. *Journal of Personality and Social Psychology*, *83*, 1423-1440.
- Ariens, G. A., van Mechelen, W., Bongers, P. M., & van der Wal, G. (2001). Psychosocial risk factors for neck pain: A systematic review. *American Journal of Industrial Medicine*, *39* (2), 180-93.
- Avey, J. B., Luthans, F., & Jenson, S. M. (2009). Psychological capital: A positive resource for combating employee stress and turnover. *Human Resource Management*, *48* (5), 677-693.
- 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), 17-28.
- Avey, J. B., Nimnicht, J. L., & Pigeon, N. (2010). Two field studies examining the association between positive psychological capital and employee performance. *Leadership & Organization Development Journal*, *31* (5), 384-401.
- Avey, J. B., Patera, J. L., & West, B. J. (2006). The implications of positive psychological capital on employee absenteeism. *Journal of Leadership & Organizational Studies*, *13* (2), 42-60.
- Avey, J. B., Reichard, R. J., Luthans, F., & Mhatre, K. H. (2011). Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviors, and performance. *Human Resource Development Quarterly*, *22* (2), 127-152.
- Avey, J. B., Wernsing, T. S., & Luthans, F. (2008). Can positive employees help positive organizational change? *Journal of Applied Behavioral Science*, *44* (1), 48-70.
- Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York, NY: Freeman.
- Bandura, A. (1999). Social cognitive theory of personality. In L. Pervin, & O. John, *Handbook of personality* (pp. 154-196). New York, NY: Guilford.
- Bennett, J. B., Broome, K. M., Pilley, A., & Gilmore, P. (2011). A web-based approach to address cardiovascular risks in managers: Results of a randomized trial. *Journal of Occupational and Environmental Medicine*, *53* (8), 911-918.

- Bennett, J. B., Patterson, C. R., Reynolds, G. S., Wiitala, W. L., & Lehman, W. E. (2004). Team awareness, problem drinking, and drinking climate: Workplace social health promotion in a policy context. *The Science of Health Promotion, 0* (0), 18-27.
- Bollen, K. A. (1984). Multiple indicators: Internal consistency or no necessary relationship? *18*, 377-385.
- Bollen, K. A., & Lennox, R. (1991). Conventional wisdom on measurement: A structural equation perspective. *110* (2), 305-331.
- Bomberger, J. T., & Matthews, K. A. (1996). A longitudinal study of the effects of pessimism, trait anxiety, and life stress on depressive symptoms in middle-aged women. *Psychology and Aging, 11* (2), 201-213.
- Bongers, P. M., Ijmker, S., van den Heuvel, S., & Blatter, B. M. (2006). Epidemiology of work related neck and upper limb problems: Psychosocial and personal risk factors (Part I) and effective interventions from a bio behavioral perspective (Part II). *Journal of Occupational Rehabilitation, 16*, 279-302.
- Bongers, P. M., Kremer, A. M., & ter Laak, J. (2002). Are psychosocial factors, risk factors for symptoms and signs of the shoulder, elbow or hand/wrist?: A review of the epidemiological literature. *American Journal of Industrial Medicine, 41*, 314-342.
- Bongers, P. M., Winter, C. R., & Kompier, M. A. (1993). Psychosocial factors at work and musculoskeletal disease. *Scandinavian Journal of Work, Environment and Health, 19*, 297-312.
- Boswell, W. R., Olson-Buchanan, J. B., & LePine, M. A. (2004). Relations between stress and work outcomes: The role of felt challenge, job control, and psychological strain. *Journal of Vocational Behavior, 64*, 165-181.
- Breslau, N., Davis, G. C., Peterson, E. L., & Schultz, L. R. (2000). A second look at comorbidity in victims of trauma: The posttraumatic stress disorder-major depression connection. *Society of Biological Psychiatry, 48*, 902-909.
- Bryant, F. (2000). Assessing the validity of measurement. In R. a. statistics, L. G. Grimm, & P. R. Yarnold (Eds.). Washington, DC: American Psychological Association.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56* (2), 81-105.
- Campbell-Sills, L., Forde, D. R., & Stein, M. B. (2009). Demographic and childhood environmental predictors of resilience in a community sample. *Journal of Psychiatric Research, 43*, 1007-1012.

- Cannon, B. (1915/1929). Alternative satisfactions for the fighting emotions. Bodily changes in pain, hunger, fear and rage: An account of recent researches into the function of emotional excitement. New York: Appleton.
- Carver, C. S., & Scheier, M. S. (2002). Optimism. In C. R. Snyder, & S. J. Lopez, *Handbook of Positive Psychology* (pp. 231-243). Oxford: Oxford University Press.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*, 245-276.
- Cavanaugh, M. A., Boswell, W. R., Roehling, M. V., & Boudreau, J. W. (2000). An empirical examination of self-reported work stress among U.S. managers. *Journal of Applied Psychology, 85* (1), 65-74.
- Cheak-Zamora, N. C., Wyrwich, K. W., & McBride, T. D. (2009). Reliability and validity of SF-12v2 in the medical expenditure panel survey. *Quality of Life Research, 18*, 727-735.
- Chong, D. S., Van Eerde, W., Chai, K. H., & Rutte, C. G. (2011). A double-edged sword: The effects of challenge and hindrance time pressure on new product development teams. *IEEE Transactions on Engineering Management, 58* (1), 71-86.
- Churchill, J. G. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research, 16*, 64-73.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 386-396.
- Cole, K., Daly, A., & Mak, A. (2009). Good for the soul: The relationship between work, wellbeing and psychological capital. *The Journal of Socio-Economics, 38* (3), 464-474.
- Cooper, C. L. (1983). Identifying stressors at work: Recent research developments. *Journal of Psychosomatic Research, 27* (5), 369-376.
- Cooper, C. L. (Ed.). (1998). *Theories of Organizational Stress*. New York, NY: Oxford University Press.
- Cooper, C. L., Sloan, S. J., & Williams, S. (1988). *The Occupational Stress Indicator*. Windsor, U.K.: NFER Nelson.
- Coutu, D. L. (2002). How resilience works. *Harvard Business Review, 80* (5), 46-55.
- Cramer, J. A., Silberstein, S. D., & Winner, P. (2001). Development and validation of the Headache Needs Assessment (HANA) Survey. *Headache, 41*, 402-409.

- Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, *52* (4), 281-302.
- 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.
- Culbertson, S. S., Huffman, A. H., & Alden-Anderson, R. (2010). Leader-member exchange and work-family interactions: The mediating role of self-reported challenge-and hindrance-related stress. *The Journal of Psychology*, *144* (1), 15-36.
- Dalal, R. S. (2005). A Meta-analysis of the relationship between organizational citizenship behavior and counterproductive work behavior. *Journal of Applied Psychology*, *90* (6), 1241-1255.
- Demerouti, E., van Eeuwijk, E., Snelder, M., & Wild, U. (2011). Assessing the effects of a "personal effectiveness" training on psychological capital, assertiveness and self-awareness using self-other agreement. *Career Development International*, *16* (1), 60-81.
- DeVillis, R. F. (2003). *Scale Development: Theory and Applications* (2nd ed.). London: Sage Publications.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). Satisfaction with life scale. *Journal of Personality Assessment*, *49*, 71-75.
- DiIorio, C., Resnicow, K., Thomas, S., Wang, D. T., Dudley, W. N., Van Marter, D. F., et al. (2002). Keepin' it R.E.A.L.!: Program description and results of baseline assessment. *Health Education & Behavior*, *29*, 104-123.
- Dunn, L. B., Iglewicz, A., & Moutier, C. (2008). A conceptual model of medical student well-being: Promoting resilience and preventing burnout. *Academic Psychiatry*, *32* (1), 44-53.
- Ebstrup, J. F., Eplöv, L. F., Pisinger, C., & Jorgensen, T. (2011). Association between the Five Factor personality traits and perceived stress: Is the effect mediated by general self efficacy? *Anxiety, Stress & Coping*, *24* (4), 407-419.
- Eby, L., Butts, M., Lockwood, A., & Simon, S. A. (2004). Proteges' negative mentoring experiences: Construct development and nomological validation. *Personnel Psychology*, *57*, 411-4447.
- Edwards, J. R. (1992). A cybernetic theory of stress, coping, and well-being in organizations. *Academy of Management Review*, *17* (2), 238-274.

- Edwards, J. R., & Cooper, C. L. (1988). The impacts of positive psychological states on physical health: A review and theoretical framework. *Social Science and Medicine*, *27*, 1447-59.
- Embretson, S. E. (1996). The new rules of measurement. *Psychological Assessment*, *8* (4), 341-349.
- Endler, N. S., & Parker, J. D. (1990a). *Coping Inventory for Stressful Situations (CISS): Manual*. Toronto, Canada: Multi-Health Systems.
- Endler, N. S., & Parker, J. D. (1989). Coping with frustrations to self-realisation Stress, anxiety, crises and asjustment. In E. Krau, *Self-realisation, Success and Adjustment* (pp. 153-164). New York: Praeger.
- Endler, N. S., & Parker, J. D. (1990). Multidimensional assessment of coping: A critical evaluation. *Journal of Personality and Social Psychology*, *58*, 844-854.
- Fleishman, J. A., Selim, A. J., & Kazis, L. E. (2010). Deriving SF-12v2 physical and mental health summary scores: A comparison of different scoring algorithms. *Quality of Life Research*, *19* (2), 231-241.
- Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behaviour*, *21*, 219-239.
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, *48* (1), 150-170.
- Folkman, S., & Moskowitz, J. T. (2000). Positive affect and the other side of coping. *American Psychologist*, *55* (6), 647-654.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*, 39-50.
- Fox, S., Spector, P. E., Goh, A., Bruursema, K., & Kessler, S. R. (2011). The deviant citizen: Measuring potential positive relations between counterproductive work behaviour and organizational citizenship behaviour. *Journal of Occupational and Organizational Psychology*, *68*, 446-460.
- Gabel, C. P., Melloh, M., Yelland, M., Burkett, B., & Roiko, A. (2011). Predictive ability of a modified Orebro Musculoskeletal Pain Questionnaire in an acute/subacute low back pain working population. *European Spine Journal*, *20*, 449-457.
- Gist, R., & Taylor, V. H. (2008). Occupational and organizational issues in emergency medical services behavioral health. *Journal of Workplace Behavioral Health*, *23* (3), 309-330.

- Greeff, A. P., & Wentworth, A. (2009). Resilience in families that have experienced heart-related trauma. *Current Psychology, 28*, 302-314.
- Greenglass, E., Schwarzer, R., Jakubiec, D., Fiksenbaum, L., & Taubert, S. (1999). The proactive coping inventory (PCI): A multidimensional research instrument. *20th International Conference of the Stress and Anxiety Research Society (STAR)*. Cracow, Poland.
- Griffith, J. N. (2011). The influence of pre-training positive psychological capital development on training motivation. *Dissertation Abstracts International Section, 71*.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85* (2), 348-362.
- Haar, J. M. (2006). Challenge and hindrance stressors in New Zealand: Exploring social exchange theory outcomes. *The International Journal of Human Resource Management, 17* (11), 1942-1950.
- Hagberg, M., Silverstien, B., Wells, R., Smith, M. J., Hendrick, H. W., Carayonn, P., et al. (1995). *Work Related Musculoskeletal Disorders (WMSDs)*. London: Taylor & Francis.
- Hall, C. (2011, November 12). *Top 100 Places to Work 2011*. Retrieved June 24, 2012, from The Dallas Morning News: <http://www.dallasnews.com/business/columnists/cheryl-hall/20111112-top-100-places-to-work-2011.ece>
- Hammer, L. B., Kossek, E. E., Anger, W. K., Bodner, T., & Zimmerman, K. L. (2010). Clarifying work-family intervention processes: The roles of work-family conflict and family-supportive supervisor behaviors. *Journal of Applied Psychology, 1-17*.
- Hargrove, M. B., Quick, J. C., Nelson, D. L., & Quick, J. D. (2011). Theory of preventive stress management: A 33-year review and evaluation. *Stress and Health, 27*, 182-193.
- Hargrove, M. B., Wright, T. A., & Quick, J. C. (2011). Further confirmation of scale reliability and predictive validity of the Wright Well-Being Inventory (WWI). *42nd Annual Meeting of the Decision Sciences Institute*. Boston, MA.
- Hinkin, T. R., & Tracey, J. B. (1999). An analysis of variance approach to content validation. *Organizational Research Methods, 2*, 175-186.
- Hobfoll, S. E., Watson, P., Bell, C. C., Bryant, R. A., Brymer, M. J., Friedman, M. J., et al. (2007). Five essential elements of immediate and mid-term mass trauma intervention: Empirical evidence. *Psychiatry, 70* (4), 283-314.

- Irmansyah, I., Dharmono, S., Maramis, A., & Minas, H. (2010). Determinants of psychological morbidity in survivors of the earthquake and tsunami in Aceh and Nias. *International Journal of Mental Health Systems*, 4 (8).
- Jerusalem, M., & Hessling, J. K. (2009). Mental health promotion in schools by strengthening self-efficacy. *Health Education*, 109 (4), 329-341.
- Kahn, R. L. (1964). Role conflict and ambiguity in organizations. *Personnel Administrator*, 9, 8-13.
- Kahn, R. L. (1987). Work stress in the 1980s: Research and practice. In J. C. Quick, J. E. Bhagat, J. E. Dalton, & J. D. Quick, *Work stress: Health care systems in the workplace*. (pp. 311-320). New York: Praeger.
- Karasek, R. A. (1998). Demand/control model: A social, emotional, and physiological approach to stress, risk, and active behavior development. In J. M. Stellman (Ed.), *Encyclopaedia of Occupational Health and Safety* (pp. 34.06-34.14). Geneva: ILO.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285-308.
- Karasek, R. A., & Theorell, T. (1990). *Healthy Work*. New York: Basic Books.
- Ke, J., Sun, J., & Li, Y. (2009). Psychological capital: Chinese indigenous scale's development and its validity comparison with the western scale. *Acta Psychologica Sinica*, 41 (9), 875-888.
- Klein-Hessling, J., Lohaus, A., & Ball, J. (2005). Psychological predictors of health-related behaviour in children. *Psychology, Health & Medicine*, 10 (1), 31-43.
- Kraaij, V., Garnefski, N., & Maes, S. (2002). The joint effects of stress, coping, and coping resources of depressive symptoms in the elderly. *Anxiety, Stress, and Coping*, 15 (2), 163-177.
- Lamontagne, A. D., Keegel, T., Louie, A. M., Ostry, A., & Landsbergis, P. A. (2007). A systematic review of the job-stress intervention evaluation literature, 1990-2005. *International Journal of Occupational and Environmental Health*, 13 (3), 268-280.
- Landsman-Dijkstra, J. J., van Wijck, R., Groothoff, J. W., & Rispens, P. (2004). The short-term effects of a body awareness program: Better self-management of health problems for individuals with chronic a-specific psychosomatic symptoms. *Patient Education and Counseling*, 55, 155-167.
- Larson, M., & Luthans, F. (2006). Potential added value of psychological capital in predicting work attitudes. *Journal of Leadership and Organizational Studies*, 13 (1), 45-62.

- Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. New York, NY: Springer.
- LePine, J. A., LePine, M. A., & Jackson, C. L. (2004). Challenge and hindrance stress: Relationships with exhaustion, motivation to learn, and learning performance. *Journal of Applied Psychology, 89* (5), 883-891.
- LePine, J.A., LePine, M.A., & Saul, J.R. (2007) Relationships among work and non-work challenge and hindrance stressors and non-work and work criteria: A model of cross-domain stressor effects. Research in Occupational Stress and Well-being. In P. Perrewé and D. Ganster (Eds.), *Research in Occupational Stress and Well-Being* (Vol. 6, pp. 35-72). New York: Elsevier.
- LePine, J. A., Podsakoff, N. P., & LePine, M. A. (2005). A meta-analytic test of the challenge stressor-hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal, 48* (5), 764-775.
- Lerner, D. J., Amick, I. B., Malspeis, S., Rogers, W. H., Santanello, N. C., Gerth, W. C., et al. (1999). The migraine work and productivity loss questionnaire: Concepts and design. *Quality of Life Research, 8*, 699-710.
- Linton, S. J. (2001). Occupational psychological factors increase the risk for back pain: a systematic review. *Journal of Occupational Rehabilitation, 11* (1), 53-66.
- Luthans, F., & Youssef, C. M. (2004). Human, social, and now positive psychological capital management: Investing in people for competitive advantage. *Organizational Dynamics, 33* (2), 143-160.
- 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.
- 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, 21* (1), 41-67.
- Luthans, F., Avey, J. B., Avolio, B. J., Norman, S. M., & Combs, G. M. (2006). Psychological capital development: Toward a micro-intervention. *Journal of Resource Management, 27* (3), 387-393.
- Luthans, F., Avey, J. B., Clapp-Smith, R., & Li, W. (2008). More evidence on the value of Chinese workers' psychological capital: A potentially unlimited competitive resource? *International Journal of Human Resource Management, 19* (5), 818-827.

- 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., & Weixing, L. (2005). The psychological capital of Chinese workers: Exploring the relationship with performance. *Management & Organization Review, 1* (2), 249-271.
- Luthans, F., Luthans, K. W., & Luthans, B. C. (2004). Positive psychological capital: Beyond human and social capital. *Business Horizons, 47* (1), 45.
- Luthans, F., Norman, S. M., Avolio, B. J., & Avey, J. B. (2008). The mediating role of psychological capital in supportive organizational climate--employee performance relationship. *Journal of Organizational Behavior, 29* (2), 219-238.
- Luthans, F., Vogelgesang, G. R., & Lester, P. B. (2006). Developing the psychological capital of resiliency. *Human Resource Development Review, 5* (1), 25-44.
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge*. New York, NY: Oxford University Press.
- MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. (2005). The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions. *Journal of Applied Psychology, 90* (4), 710-730.
- Maslach, C., & Jackson, S. E. (1986). *Manual Maslach Burnout Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Maslach, C., Jackson, S. E., & Leiter, M. P. (1997). Maslach Burnout Inventory. In C. P. Zalaquett, & R. J. Woods (Eds.), *Evaluating Stress: A book of resources* (pp. 191-218). Lanham, MD: Scarecrow Press.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology, 52*, 397-422.
- Masten, A. (2001). Ordinary magic: Resilience Processes in Development. *American Psychologist, 56* (3), 227-238.
- McFarlane, A. C., Williamson, P., & Barton, C. A. (2009). The impact of traumatic stressors in civilian occupational settings. *Journal of Public Health Policy, 30* (3), 311-327.
- McMurray, A. J., Pirola-Merlo, A. A., Sarros, J. C., & Islam, M. M. (2010). Leadership, climate, psychological capital, commitment, and wellbeing in a non-profit organization. *Leadership & Organization Development Journal, 31* (5), 436-457.
- Mitchell, J. B. (1997). Quantitative science and the definition of measurement in psychology. *British Journal of Psychology, 88*, 355-383.

- Muthén, B. (1990). Moments of the censored and truncated bivariate normal distribution. *British Journal of Mathematical and Statistical Psychology*, *43*, 131-143.
- Muthén, B. (1989). TOBIT factor analysis. *British Journal of Mathematical and Statistical Psychology*, *42*, 241-250.
- Nelson, D. L., & Simmons, B. L. (2003). Health psychology and work stress: A more positive approach. In J. C. Quick, & L. E. Tetrick (Eds.), *Handbook of Occupational Health Psychology* (pp. 97-119). Washington, DC: American Psychological Association.
- Nelson, D. L., & Simmons, B. L. (2011). Savoring eustress while coping with distress: the holistic model of stress. In J. C. Quick, & L. E. Tetrick, *Handbook of Occupational Health Psychology* (pp. 55-74). Washington, DC: American Psychological Association.
- Nelson, D. L., & Sutton, C. (1990). Chronic work stress and coping: A longitudinal study and suggested new directions. *Academy of Management Journal*, *33* (4), 859-869.
- Nezu, A. M., Nezu, C. M., Felgoise, S. H., McClure, K. S., & Houts, P. S. (2003). Project genesis: Assessing the efficacy of problem-solving therapy for distressed adult cancer patients. *Journal of Consulting and Clinical Psychology*, *71* (6), 1036-1048.
- O'Connor, R., & Cassidy, C. (2007). Predicting hopelessness: The interaction between optimism/pessimism and specific future expectancies. *Cognition and Emotion*, *21* (3), 596-613.
- O'Donnell, M. L., Creamer, M., & Pattison, P. (2004). Posttraumatic stress disorder and depression following trauma: Understanding comorbidity. *The American Journal of Psychiatry*, *161*, 1390-1396.
- O'Sullivan, G. (2011). The relationship between hope, eustress, self-efficacy, and life satisfaction among undergraduates. *Social Indicators Research*, *101* (1), 155-172.
- Pearsall, M. J., Ellis, A. P., & Stein, J. H. (2009). Coping with challenge and hindrance stressors in teams: Behavioral, cognitive, and affective outcomes. *Organizational Behavior and Human Decision Processes*, *109*, 18-28.
- 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.
- Pittenger, C., & Duman, R. S. (2008). Stress, depression and neuroplasticity: A convergence of mechanisms. *Neuropsychopharmacology Reviews*, *33*, 88-109.

- Podsakoff, N. P. (2007). Challenge and hindrance stressors in the workplace: Tests of linear, curvilinear, and moderated relationships with employee strains, satisfaction, and performance. Dissertation, University of Florida.
- Podsakoff, N. P., LePine, J. A., & LePine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: A meta-analysis. *Journal of Applied Psychology, 92* (2), 438-454.
- Quick, J. C., & Quick, J. D. (1979). Reducing stress through preventive management. *Human Resource Management, 18* (3), 15-22.
- Quick, J. C., & Quick, J. D. (1984). *Organizational Stress and Preventive Management*. New York: McGraw Hill.
- Quick, J. C., & Quick, J. D. (2004). Healthy, happy, productive work: A leadership challenge. *Organizational Dynamics, 33* (4), 329-337.
- Quick, J. C., Quick, J. D., Nelson, D. L., & Hurrell, J. J. (1997). *Preventive Stress Management in Organizations*. Washington, DC: American Psychological Association.
- Quick, J. C., Wright, T. A., Adkins, J. A., Nelson, D. L., & Quick, J. D. (2013). *Preventive Stress Management in Organizations (2nd Ed.)*. Washington, D.C.: American Psychological Association.
- Quick, J. D., Quick, J. C., & Nelson, D. L. (1998). The Theory of Preventive Stress Management in Organizations. In C. L. Cooper (Ed.), *Theories of Organizational Stress* (pp. 246-269). Oxford University Press.
- Regehr, C., LeBlanc, V., Jelley, R. B., & Barath, I. (2008). Acute stress and performance in police recruits. *Stress & Health, 24* (4), 295-303.
- Rego, A., Marques, C., Leal, S., Sousa, F., & e Cunha, M. (2010). Psychological capital and performance of Portuguese civil servants: Exploring neutralizers in the context of an appraisal system. *The International Journal of Human Resource Management, 21* (9), 1531-1552.
- Resick, P. A. (2007). Commentary on "Five Essential Elements of Immediate and Mid-Term Mass Trauma Intervention: Empirical Evidence" by Hobfoll, Watson et al. Whose role is it any way? *Psychiatry, 70* (4), 350-353.
- Richardson, K. M., & Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: A meta-analysis. *Journal of Occupational Health Psychology, 13* (1), 69-93.

- Rodell, J. B., & Judge, T. A. (2009). Can "good" stressors spark "bad" behaviors? The mediating role of emotions in links of challenge and hindrance stressors with citizenship and counterproductive behaviors. *Journal of Applied Psychology, 94* (6), 1438-1451.
- Sackett, P. R., Berry, C. M., & Wiemann, S. A. (2006). Citizenship and counterproductive behavior: Clarifying relations between the two domains. *Human Performance, 19* (4), 441-464.
- Scheier, M. F., & Carver, C. S. (1992). Effects of optimism on psychological and physical well-being: Theoretical overview and empirical update. *Cognitive Therapy in Research, 16* (2), 201-228.
- Schwab, D. P. (1980). Construct validity in organizational behavior. In B. M. Staw, & L. L. Cummings (Eds.), *Research in Organizational Behavior, 2* (pp. 3-43).
- Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist, 54* (2), 93-105.
- Schwarz, N., & Strack, F. (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In D. Kahneman, E. Diener, & N. Schwarz, *Well-being: The foundations of hedonic psychology* (pp. 61-84). New York: Russell Sage.
- Schwarzer, R., & Knoll, N. (2003). Positive coping: Mastering demands and searching for meaning. In S. J. Lopez, & S. J. Snyder, *Positive psychological assessment: A handbook of models and measures* (pp. 393-409). Washington, D.C.: American Psychological Association.
- Seegerstrom, S. C., Taylor, S. E., Kemeny, M. E., & Fahey, J. L. (1998). Optimism is associated with mood, coping, and immune change in response to stress. *Journal of Personality and Social Psychology, 74* (6), 1646-1655.
- Seligman, M. E. (2002). Positive psychology, positive prevention, and positive therapy. In C. R. Snyder, & S. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 3-9). New York, NY: Oxford University Press .
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive Psychology. *American Psychologist, 55* (1), 5-14.
- Selye, H. (1975). Confusion and controversy in the stress field. *Journal of Human Stress, 1* (2), 37-44.
- Shen, Y. (2009). Relationships between self-efficacy, social support and stress coping strategies in Chinese primary and secondary school teachers. *Stress and Health, 25*, 129-138.

- Smith, A. (2000). The scale of perceived occupational stress. *Occupational Medicine*, 50 (5), 294-298.
- Smith, E. J. (2006). The strength-based counseling model: A paradigm shift in psychology. *The Counseling Psychologist*, 34 (1), 134-144.
- Snyder, C. R., Ilardi, S. S., Cheavens, J., Michael, S. T., Yamhure, L., & Simpson, S. (2000). The role of hope in cognitive-behavior therapies. *Cognitive Therapy and Research*, 24 (6), 747-762.
- Snyder, C. R., Irving, L. M., & Anderson, S. A. (1991). Hope and health: Measuring the will and the ways. In C. Snyder, & F. D.R., *Handbook of social and clinical psychology: The health perspective* (pp. 285-305). Elmsford, NY: Pergamon.
- Soto, C., & John, O. (2009). Ten facet scales for the big five inventory: Convergence with NEO PI-R facets, self-peer agreement and discriminate validity. *Journal of Research in Personality*, 43 (1), 84-90.
- Tol, W. A., Komproe, I. H., Jordans, M. J., Gross, A. L., Susanty, D., Macy, R. D., et al. (2010). Mediators and moderators of psychosocial intervention for children affected by political violence. *Journal of Consulting and Clinical Psychology*, 78 (6), 818-828.
- Uttl, B. (2005). Measurements of individual differences: Lessons from memory assessment in research and clinical practice. *Psychological Science*, 16 (6), 460-467.
- Van der Doef, M., & Maes, S. (1999). The job demand-control (-support) model and psychological well-being: A review of 20 years of empirical research. *Work & Stress: An International Journal of Work, Health & Organisations*, 13 (2), 87-114.
- Vanroelen, C., Levecque, K., Moors, G., Gadeyne, S., & Louckx, F. (2009). The structuring of occupational stressors in a Post-Fordist work environment. Moving beyond traditional accounts of demand, control and support. *Social Science & Medicine*, 68, 1082-1090.
- Walumbwa, F. O., Peterson, S. J., Avolio, B. J., & Hartnell, C. A. (2010). An investigation of the relationships among leader and follower psychological capital, service climate, and job performance. *Personnel Psychology*, 63 (4), 937-963.
- Wang, L., Zhang, Z., McArdle, J. J., & Salthouse, T. A. (2008). Investigating ceiling effects in longitudinal data analysis. *Multivariate Behavioral Research*, 43 (3), 476-496.

- Ware, J. E., Kosinski, M., & Dewey, J. E. (2000). *How to score version two of the SF-36 health survey*. Lincoln, RI: QualityMetric Incorporated.
- Ware, J. E., Kosinski, M., Turner-Bowker, D. M., & Gandek, B. (2002). *How to score version 2 of the SF-12 Health Survey*. Lincoln, RI: QualityMetric Incorporated.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology*, *47*, 1063-1070.
- Webster, J. R., Beehr, T. A., & Christiansen, N. D. (2010). Toward a better understanding of the effects of hindrance and challenge stressors on work behavior. *Journal of Vocational Behavior*, *76* (1), 68-77.
- Webster, J. R., Beehr, T. A., & Love, K. (2011). Extending the challenge-hindrance model of occupational stress: The role of appraisal. *Journal of Vocational Behavior*, *79* (2), 505-516.
- Wen, L., Qi, S., & Zhang, Y. (2009). A preliminary revision of Luthans psychological capital questionnaire. *Chinese Journal of Clinical Psychology*, *17* (2), 148-150.
- Williams, J. L., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, *17*, 601-607.
- Wright, T. A., & Huang, C-C. (2009). Development and further validation of the Wright Well-Being Inventory. *Academy of Management Meeting*. Chicago, IL.
- Wright, T. A., & Quick, J. C. (2009). The emerging positive agenda in organizations: Greater than a trickle, but not yet a deluge. *Journal of Organizational Behavior*, *30* (2), 147-159.
- Wright, T. A., Huang, C-C., & Wefald, A. J. (2009). Development and Initial Validation of the Wright Well-Being Inventory (WWI). *Association for Psychological Science*.
- Xiao, W., & Li, L. (2010). Primary development of college students' psychological capital questionnaire. *Chinese Journal of Clinical Psychology*, *18* (6), 691-694.
- Xu, J., Kochanek, K. D., Murphy, S. L., & Tejada-Vera, B. (2010). Deaths: Final data for 2007. *National Vital Statistics Reports* (58), 1-136.
- Zhong, L. (2007). Effects of psychological capital on employees' job performance, organizational commitment, and organizational citizenship behavior. *Acta Psychologica Sinica*, *39* (2), 328-334.

BIOGRAPHICAL INFORMATION

M. Blake Hargrove has been appointed an Associate Professor of Management at the Grove School of Business at Shippensburg University. Dr. Hargrove's research interests include organizational stress, positive organizational behavior, business ethics, and psychometrics. His research has been published in journal articles and several book chapters. He holds a B.A. in Liberal Studies from Regents College, a M.A. in Management from Webster University, and a Ph.D. in Management from the University of Texas at Arlington. Dr. Hargrove has a strong teaching background and broad business experience. Prior to earning his doctorate, he was a tenured professor at McLennan Community College in Waco, Texas. He is an active real estate investor and has more than twenty years experience in small business, eight as the owner of a vertically-integrated recycling, remanufacturing, and custom hardwood flooring enterprise. Prior to his business career, he served in the United States Navy Submarine Service. Dr. Hargrove is married to Debra Fischman Hargrove, a human resources executive. They have two daughters, Katie and Alice. The family currently resides in the lovely Cumberland Valley of southern Pennsylvania.