Spring 5-28-2014

Exploring Different Operationalizations of Employee Engagement and Their Relationships with Workplace Stress and Burnout Among IT Professionals in Community Hospitals

Paula E. Anthony-McMann

EXPLORING DIFFERENT OPERATIONALIZATIONS OF EMPLOYEE ENGAGEMENT AND THEIR RELATIONSHIPS WITH WORKPLACE STRESS AND BURNOUT AMONG IT PROFESSIONALS IN COMMUNITY HOSPITALS

by

PAULA E. ANTHONY-MCMANN

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
Department of Human Resource Development and Technology

Andrea D. Ellinger, Ph.D., Committee Chair

College of Business and Technology

The University of Texas at Tyler
August 2014

The University of Texas at Tyler
Tyler, Texas

This is to certify that the Doctoral Dissertation of

PAULA E. ANTHONY-MCMANN

has been approved for the dissertation requirement on
May 8, 2014
for the Doctor of Philosophy degree

Approvals:

Dissertation Chair: Andrea D. Ellinger, Ph.D.

Member: Jerry W. Gilley, Ed.D.

Member: Marina Astakhova, Ph.D.

Member: Jonathon R. B. Halbesleben, Ph.D.

Chair, Department of Human Resource Development and Technology: Jerry W. Gilley, Ed.D.

Interim Dean, College of Business and Technology: Jerry W. Gilley, Ed.D.

Acknowledgements

With boundless love and gratitude to George, Ally and Lauren McMann for their unwavering support. Thank you to the faculty and staff of The University of Texas at Tyler and to the cohorts of 2011 and 2012 for joining me on this remarkable journey. Thank you to my committee chair, Dr. Andrea Ellinger, and to the rest of my committee, Dr. Jerry Gilley, Dr. Marina Astakhova and Dr. Jonathon Halbesleben, for their extraordinary wisdom and guidance. Thank you Cindy Klein and Donna Spann for being the best of friends, and finally, thank you to my parents, Michael and Elaine Antonakes, for always encouraging me to dream.

Table of Contents

List of Tables

List of Figures

Abstract

EXPLORING DIFFERENT OPERATIONALIZATIONS OF EMPLOYEE ENGAGEMENT AND THEIR RELATIONSHIPS WITH WORKPLACE STRESS AND BURNOUT AMONG IT PROFESSIONALS IN COMMUNITY HOSPITALS

Paula Anthony-McMann

Dissertation Chair: Andrea D. Ellinger, Ph.D.

The University of Texas at Tyler
August 2014

This study suggested that the relationships between workplace stress, burnout and employee engagement depend on how the construct of employee engagement is actually measured. The study's hypotheses predicted negative relationships between employee engagement and workplace stress and further predicted that burnout would play a mediating role in those negative relationships. However, it was predicted that even similarly conceptualized measures of employee engagement would expose different relationships with these variables suggesting that the selection of employee engagement measurement instruments is vital both to understanding different aspects of the construct and to its operationalization in practice.

Responding to a resurgence in scholarly interest in Kahn's (1990) conceptualization, two different (but similarly conceptualized) needs-satisfaction based measurements of employee engagement were employed: the Rich Scale (Rich, Lepine,

& Crawford, 2010) and the ISA Scale (Soane et al., 2012). This study examined the relationships between workplace stress, burnout and engagement on both the overall and subscale (or dimensional) components of these two instruments to understand the similarities and differences between them and to evaluate what those similarities and/or differences might suggest from both a theoretical and practical perspective. Further, by not using burnout-antithesis based measures of engagement (which are often used in engagement-related research), this study sought to address some of the tensions in the scholarly literature about the relationships between burnout and employee engagement.

Chapter 1 – Introduction

Background to the Problem

Gertrude Stein (2012) once suggested that simply using a name implies an identity long before anything is actually known about the subject of that name. The term "engagement," once reflective of Kahn's (1990) seminal work on personal engagement, is now used ubiquitously in research and in practice (Shuck, Ghosh, Zigarmi, & Nimon, 2012). Whereas Kahn's work is still often cited as the theoretical underpinning of engagement-related research, the construct has, in reality, evolved to reflect many different meanings borne of different conceptualizations and operationalizations (Cole, Walter, Bedeian, & O'Boyle, 2012; Saks, 2008). As a result, the widely-used term "engagement" may suggest Kahn's original identity or meaning, or it may not be the same "engagement" that he theorized at all.

Engagement was originally defined by Kahn (1990) as the "harnessing [of] organization members' selves to their work roles" (p. 694) and depended upon the satisfaction of certain psychological pre-conditions or needs. Many scholars have since studied the factors that can influence an employee's willingness to engage and the circumstances under which he or she might stay engaged (Albrecht, 2010), and a number of measurement scales have been developed to operationalize and test engagement in the workplace (Bakker, Schaufeli, Leiter, & Taris, 2008; Demerouti & Bakker, 2007; Harter, Schmidt, & Hayes, 2002; Maslach, Jackson, & Leiter, 1996; May, Gilson, & Harter,

2004; Rich et al., 2010; Saks, 2006; Schaufeli, Salanova, González-Romá, & Bakker, 2002; Soane et al., 2012). Although the construct remains an area of considerable interest to scholars and Human Resources Development (HRD) practitioners, there appears to be significant disagreement as to its nomological framework and, and as a result, the mechanisms by which it is measured (Viljevac, Cooper-Thomas, & Saks, 2012). The consequence of this disagreement suggests that different measurements of engagement may, in fact, be measuring differing aspects of engagement. This both confounds the understanding of engagement, particularly in relationship to other variables, and makes the operationalization of the construct all the more difficult in practice (Shuck et al., 2012). Further, it risks that the meaning of engagement will be lost as the term becomes overly generalized.

The relationship between workplace stress (and the potential consequence of burnout) and employee engagement is interesting because it is universal in its applicability to the business context and particularly relevant to the current organizational change-related circumstances in the healthcare industry (Halbesleben, 2008c). The nature of the relationship between engagement and burnout also represents one of the more significant differences of opinion among organizational scholars (Fletcher & Robinson, 2013; Shuck, 2011; Shuck et al., 2012). For the purposes of this discussion, workplace stress occurs when there is a loss, or threat of loss, of an individual's valued resources (Hobfoll, 1989). Burnout occurs as a consequence of "prolonged response to chronic emotional and interpersonal stressors on the job" (Maslach, Schaufeli, & Leiter, 2001, p. 397) and is defined as "a state of physical, emotional and mental exhaustion

caused by long-term involvement in situations that are emotionally demanding" (Pines & Aronson, 1988, p. 9).

Engagement-related research has focused frequently on the over 2.7 million clinical professionals working in the U.S. healthcare industry (Albrecht, 2010; Anthony, Lunn, Maffei, & Ellinger, 2014; Halbesleben, 2010; Kahn, 2005; Laschinger & Finegan, 2005). Significantly, this research has shown engagement to be positively correlated to performance outcomes by clinicians in healthcare settings (Small & Small, 2011; Squazzo, 2011; Wagner, 2006). However, employee engagement—that is, an employee's psychological and affective focus on and commitment to an organization's objectives (Shuck & Wollard, 2010)—among the almost equal number of healthcare professionals working in non-clinical capacities is of increasing interest given the current climate of change in the U.S. healthcare industry (AHA, 2012b; Anthony et al., 2014).

Community hospitals in the U.S. are in a state of transformative change (Mathews, 2011) and, as such, represent an interesting environment within which to evaluate the consequential impact of change-related factors, such as stress or burnout, on different operationalizations of engagement (Demerouti, Bakker, & Mostert, 2010; Kahn, 1990; Maslach et al., 2001; Nahrgang, Hofmann, & Morgeson, 2011). Industry experts agree that within the next five to ten years, the hospitals that survive will be those that can compete in a climate that demands increased transparency, greater accountability for outcomes, collaborative ventures that support population health management, shifts in delivery models from inpatient/acute services to outpatient/preventive services, and financial stability in spite of shrinking payments for healthcare services ("Affordable

Care Act," 2010; Anthony et al., 2014; Gostin, 2012; Mathews, 2011). The success of the change initiatives, some of which are legislatively mandated, ultimately depends upon the adaptability and sustained engagement of the workforces of healthcare organizations (Blumenthal, 2009; Rae-Dupree, 2009). In particular, the federal requirement to implement electronic health records (EHRs) in community hospitals by 2015, is having a dramatic impact on these organizations as it requires hospital employees to work under significant stress while simultaneously remaining engaged in the provision of services (Brooks & Grotz, 2010).

Although still a new phenomenon, there is emerging research on impact of stress associated with the implementation of EHRs (Gagnon et al., 2010; Scott, Rundall, Vogt, & Hsu, 2005). However, these studies have focused almost exclusively on practicing clinicians (including physicians, nurses and therapists) and the challenges they face in learning new workflows and adjusting their decades-honed practices of care delivery (Babbott et al., 2013; Hennington, Janz, & Poston, 2011). Searches of major academic databases evidenced little empirical study of the impact of EHRs on the stress and/or burnout levels of the Information Technology (IT) professionals who are charged with implementing such technology-oriented systems. Anecdotally, however, it is widely reported among healthcare IT leaders that the changing roles of IT professionals, which puts them closer to the patient care process, the changing environment within which they work, and federally mandated implementation deadlines which are tied to both incentive payments and penalties are introducing a degree of stress among these professionals unlike any seen before (Cotter, 2012).

A consequence of prolonged stress among these employees may be the exhaustion associated with the condition of burnout (Gorgievski & Hobfoll, 2008; Moore, 2000; Pines & Aronson, 1988) and the subsequent negative impact to employee engagement (Maslach et al., 2001; Schaufeli & Bakker, 2004). However, stress may also impact employee engagement long before the stressful conditions lead to burnout. To the degree that IT employee engagement is negatively impacted by workplace stress, the risk of EHR failure increases and the negative consequences of such failure potentially increase as well. Further, critical performance outcomes for hospitals are now dependent upon the successful adoption and use of these complex and disruptive EHRs, and this outcome is also likely to be related to the engagement levels of IT professionals working to support this initiative (Anthony et al., 2014).

As it stands today, it remains challenging for HRD practitioners and other healthcare leaders to design and implement interventions that can mitigate the negative effects of workplace stress and/or burnout and create work environments conducive to the sustained engagement of employees (Anthony et al., 2014). Given both the breadth and depth of the current change-related efforts which require IT professionals to be engaged in their work and the related circumstances surrounding the actual stress levels of employees working to implement and support EHRs, an interesting opportunity is now present for further research aimed at understanding how the relationships between these constructs may, in fact, depend on the mechanism by which employee engagement is measured. Further, as the sustained engagement of employees is widely linked to positive organizational outcomes in many industries (Shuck, Reio, & Rocco, 2011;

Shuck, Rocco, & Albornoz, 2011), understanding the operationalization of the construct is undeniably valuable—both in research and in practice (Fletcher & Robinson, 2013; Shuck, Nimon, & Zigarmi, 2013).

Statement of the Problem

Employee engagement remains the focus of much empirical study. However, differences in the nomological framework of the construct have resulted in differences in the mechanisms by which it is measured and operationalized (Christian, Garza, & Slaughter, 2011; Halbesleben, 2008b; Shuck, 2011; Shuck et al., 2012; Shuck et al., 2013; Viljevac et al., 2012). Understanding the relationship engagement has to other variables is confounded because differential findings have been likely influenced by the instruments used to measure employee engagement and their sensitivities to measuring employee engagement in certain contexts. For example, four materially different frameworks for understanding engagement have been identified and each has been operationalized with different measurement instruments (Fletcher & Robinson, 2013; Shuck, 2011).

First, in one of the most heavily researched engagement perspectives, the burnout-antithesis framework, scholars position engagement and burnout in relation to each other—either as opposite ends of the same continuum, or as separate constructs but still antipodean (Bakker et al., 2008; Demerouti, Bakker, Vardakou, & Kantas, 2002; Maslach et al., 2001; Schaufeli, Bakker, & Salanova, 2006; Shirom, 2004). Next, the job satisfaction framework positions engagement as analogous to job satisfaction (Harter et al., 2002; Robinson, Perryman, & Hayday, 2004). Saks' (2006) multi-dimensional

framework suggests that engagement can be related to an employee's job and/or the organization for which he/she works. Finally, Kahn (2013) maintains that engagement is its own construct and is independent of both burnout and job satisfaction, but he acknowledges that his needs-satisfaction based conceptualization has not yet been fully operationalized.

Substantial research has studied both the burnout-antithesis and job satisfaction-based operationalizations. Yet, there is tension in the scholarly literature about these approaches and, thus, interest in operationalizing Kahn's (1990) perspective is increasing (Fletcher & Robinson, 2013; Shuck, 2011; Shuck et al., 2012). Indeed, a number of measurement instruments have been developed based on Kahn's (1990) conceptualization, but even they appear to be nomologically different from one another—contributing even further to the "jingle jangle" (p. 11) that is employee engagement (Shuck et al., 2012).

For example, the May, Gibson and Harter (2004) scale (the "May Scale") and the Rich, Lepine and Crawford (2010) employee engagement scale (the "Rich Scale") both measure cognitive, emotional and physical factors which were empirically linked to Kahn's (1990) three psychological pre-conditions of engagement (i.e., meaningfulness, availability and safety). But, the two scales include different items with the Rich Scale reflecting more of a multi-dimensional framework. More recently, Soane et al.'s (2012) Intellectual, Social, Affective Engagement Scale (the "ISA Scale") includes intellectual factors and affective factors that are similar to some of the elements in the May Scale and Rich Scale, but also includes a social component reflecting the researchers' belief that

employees need to work positively together and share common values to be engaged. Although these instruments all purport to measure employee engagement and are clearly grounded in Kahn's (1990) conceptualization, the results have the potential to be influenced by different variables and/or linked to different consequences (Fletcher & Robinson, 2013).

Kahn's (2005, 2007a, 2007b; Kahn & Heaphy, 2013) later work emphasized the primacy of psychological safety, predicated on the presence of positive and trusting interpersonal relationships at work, as key to understanding how engagement was conceptualized. A number of scholars concur that the presence of positive workplace relationships is a key antecedent to the psychological conditions necessary under Kahn's (1990) conceptualization of engagement (Schneider, Macey, Barbera, & Young, 2010). This suggests that the presence (or absence) of positive relationships may impact the effects of workplace stress and/or burnout on employee engagement; however, these relationships have not been studied. It also suggests that if the measurement of engagement includes an element of interpersonal or social connectedness (i.e., positive relationships), the outcome of employee engagement may be more resilient to those factors that seek to undermine it.

Empirical studies of engagement in healthcare-related work settings have revealed positive correlations to performance outcomes such as patient safety and quality of care (Laschinger & Finegan, 2005; Small & Small, 2011; Squazzo, 2011; Wagner, 2006) and negative relationships to turnover intention (Shuck & Twyford, 2013). However, few empirical studies of engagement among IT professionals have been

conducted in any industry (Gan & Gan, 2013). More importantly though, research that measures employee engagement (in both healthcare and other contexts) has varied significantly due to the use of different instruments that are grounded in very different conceptualizations of the construct. And, even similarly conceptualized measures reflect slightly (or perhaps significantly) different perspectives. This begs the question of what exactly has been measured and, therefore, what exactly the research may be suggesting.

It is imperative that concept of employee engagement be understood in theoretical terms, but also in such a way that supports its clear operationalization and mitigates the risk that it will become overly generalized. Therefore, research that 1) explores the relationships between stress, burnout and the engagement levels of employees and 2) seeks to understand how differences in these relationships may be due to variations in the way employee engagement is operationalized will be valuable both to scholars and practitioners seeking a more complete understanding of the construct of engagement and looking to suggest workplace interventions and/or design environments conducive to the sustained engagement of employees (Fletcher & Robinson, 2013; Shuck et al., 2012).

Purpose of the Study

The purpose of this study was to examine the relationships between workplace stress, burnout and employee engagement using two different engagement measurement instruments and to examine these relationships at the overall (i.e., all dimensions or subscales) and dimensional level of each engagement instrument. Responding to a resurgence in scholarly interest in Kahn's (1990) conceptualization, two different needs-satisfaction based measurements of employee engagement were employed. The

relationship each operationalization has with workplace stress and burnout was examined among IT professionals working on EHR implementations in U.S.-based community hospitals.

This study suggests that the relationships between workplace stress, burnout and employee engagement depend on how the construct of employee engagement is measured. Further, even similarly conceptualized measures of employee engagement may expose different relationships with these variables suggesting that the selection of employee engagement measurement instruments is vital both to understanding different aspects of the construct and to its operationalization in practice. Therefore, the study examined each of the dimensional components of the two needs-satisfaction based engagement scales because if, as Kahn (1990, 2007b) suggests, the presence (or absence) of positive, trusting interpersonal relationships at work is key to employee engagement, an engagement measure that includes a social or connectedness dimension will likely be more sensitive to the presence (or absence) of these relationships (Shuck & Wollard, 2010; Soane et al., 2012). Ultimately, the study was aimed at addressing the identified gaps in the literature by clarifying the construct of employee engagement in a healthcare context through the exploration of these different operationalizations.

Theoretical/Conceptual Underpinnings of the Study

This study was theoretically underpinned by Hobfoll's (1989) conservation of resources (COR) theory as it relates to workplace stress and Pines and Aronson's (1988) exhaustion-based conceptualization of burnout. Most importantly, Kahn's (1990) needs-satisfaction based conceptualization of personal engagement both underpinned the

study's understanding of employee engagement and represented the lens through which the construct was operationalized. Also, his perspectives on the presence of positive, trusting interpersonal relationships at work as foundational to engagement were pivotal to understanding potential differences in the two operationalizations of employee engagement under consideration (Kahn, 2005, 2007a, 2013). The next sections present a brief overview of these constructs.

Workplace Stress

Early conceptualizations of workplace stress grew out of studies in the biological and physical sciences that examined an individual's response (alerting, resistance and exhaustion) to environmental challenges (Seyle, 1946). Evolving significantly in the subsequent years and in response to the need to understand the construct within the context of organizational settings, conservation of resources (COR) theory emerged in the 1990s as a new and now widely accepted conceptualization of stress in the workplace (Hobfoll, 1989). This perspective suggests that people strive to keep and obtain valued resources and that they are threatened by the loss or threat of loss of those resources (Gorgievski & Hobfoll, 2008; Halbesleben, 2006; Hobfoll, 1989).

A number of operationalizations of workplace stress based on COR have since been developed including the job-demands resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), the role-stress fit model (LeRouge, Nelson, & Blanton, 2006), the demands-control model (Karasek, 1979) and the efforts-reward imbalance model (Siegrist, 1996). Even instruments originally developed and empirically tested to measure general perceptions and consequences of workplace stress (S. Cohen, Karmark,

& Mermelstein, 1983) have since evolved to more closely reflect the underpinnings of COR (Mahmood, Coons, Guy, & Pelletier, 2010). The findings from these operationalizations reveal behavioral manifestations of stress that bear remarkable similarity to those described by Kahn (1990) as stemming from disengaged employees. Although Hobfoll (1989) did not use the term "disengagement", he cited a familiar behavior pattern in people under stress stating that individuals experiencing stress will "strive to minimize net loss of resources" (1989, p. 517). In other words, they may limit their engagement to the extent it threatens their resources. Positioned conversely, this suggests that employees who are less stressed may also be more likely to stay engaged.

Burnout

Research on the condition of workplace burnout began with the study of professionals working in the human services and healthcare industries and linked emotional depletion with the loss of motivation and commitment (Freudenberger, 1975, 1986; Maslach, 1976). Initial studies focused on burnout not as a response to stress, but in terms of the transactions and relationships between individuals at work (Maslach et al., 2001). However, the understanding of the construct of burnout expanded significantly in the early 1980s with the work of scholars who conceptualized burnout as the consequence of prolonged exposure to stress (Maslach & Jackson, 1981). Many years later, another specific link between burnout and stress was posited by Gorgievski and Hobfoll (2008) who suggested, in accordance with COR theory, that burnout was the unavoidable result of the chronic and steady depletion of an individual's resources.

Evidenced by exhaustion, cynicism and reduced personal efficacy, burnout, as a consequence of prolonged stress, was operationalized by the Maslach Burnout Instrument (MBI) (Maslach & Jackson, 1981; Maslach et al., 1996). The MBI, which is proprietary but remains in wide use today, was challenged by a number of scholars who objected to the framing of the survey questions (Halbesleben & Demerouti, 2005). As a result, another burnout instrument, the OLBI, was developed that expanded earlier operationalizations but remained grounded in Maslach and Jackson's (1981) conceptualization (Demerouti et al., 2002).

Another broadly recognized conceptualization of burnout was posited by Pines and Aronson (1988) as "a state of physical, emotional and mental exhaustion caused by long-term involvement in situations that are emotionally demanding" (p. 9). A measure of this exhaustion-based conceptualization, the Burnout Measure (BM), is also in wide use—second only to the MBI in terms of frequency (Schaufeli, Enzmann, & Girault, 1993). Importantly, scholars agree that the burnout instruments in broadest use in research and practice, the MBI and the BM, reflect the underlying premise of burnout as resulting from the exhaustion of an individual's resources (Schaufeli et al., 1993). Further, emotional exhaustion appears to be the most consistently validated dimension of burnout across all burnout measurement instruments (Schaufeli et al., 1993).

More recently, the construct of burnout has been positioned by a number of scholars as the opposite or antipode of engagement under the premise that those who were engaged could not be burned out at the same time (Maslach et al., 2001; Schaufeli et al., 2002). This perspective also suggests that employee engagement can be measured by

the negative responses to certain burnout measures, including the MBI and OLBI (Demerouti et al., 2002; Maslach et al., 2001). However, this remains the subject of much disagreement as both theory and empirical research suggest that although burnout and engagement may be negatively related, they are entirely separate constructs (Cole et al., 2012; Kahn, 2013; Schaufeli & Buunk, 2002).

Employee Engagement

The concept of engagement emerged from the positive psychology movement in which researchers began to focus on understanding the factors that can lead to and sustain positive human behaviors and the related positive consequences of those behaviors (Alderfer, 1972; Kahn, 1990, 1992; Seligman & Csikszentmihalyi, 2001). Kahn's (1990) original conceptualization of engagement was that it was personal and reflected the "harnessing [of] organization members' selves to their work roles" (p. 694). Importantly, three psychological pre-conditions or needs were necessary for individuals to be and stay engaged: meaningfulness, safety and availability (Kahn, 1990).

In the years since Kahn's (1990) groundbreaking research, four distinct frameworks of engagement have been identified (Fletcher & Robinson, 2013; Shuck, 2011; Shuck et al., 2013): 1) a needs-satisfaction framework (Kahn, 1990; May et al., 2004; Rich et al., 2010; Soane et al., 2012); 2) a burnout-antithesis framework (Maslach et al., 2001; Schaufeli et al., 2006; Shirom, 2004); 3) a job satisfaction framework (Harter et al., 2002; Robinson et al., 2004); and 4) a multi-dimensional framework (Saks, 2006). Each of these materially different frameworks has been operationalized with different instruments, all of which measure "engagement".

In the scholarly literature, the measurement of employee engagement is largely dominated by the burnout-antithesis framed UWES instrument (Schaufeli et al., 2006). Despite its broad acceptance, however, there is evidence to suggest that the UWES may, in fact, measure the antipode of burnout, but not necessarily the construct of engagement (Cole et al., 2012). The job satisfaction-based operationalization is also in wide use (Harter et al., 2002; Robinson et al., 2004), but this perspective has also been challenged by research suggesting that job satisfaction is not analogous to employee engagement (Christian et al., 2011; Zigarmi, Nimon, & Shuck, 2014).

The needs-satisfaction framework, which is based on Kahn's (1990) conceptualization, was empirically tested by May et al. (2004); however, the measurement instrument developed by these researchers revealed some reliability challenges at the subscale domain level (Viljevac et al., 2012). This conceptualization was expanded to a multi-dimensional framework through the research of Saks (2006) and Rich (2010)—the latter study resulting in one of the purest operationalizations of Kahn's (1990) original perspective on employee engagement (Shuck et al., 2013). Recently, another needs-satisfaction based instrument, the ISA Engagement scale, was developed to include a social or interpersonal connectedness dimension reflecting the researchers' belief that, in accordance with Kahn (2007b), employees need positive relationships at work in order to be engaged (Soane et al., 2012).

Describing positive, trusting relationships as "resilient", Kahn (2005; Kahn & Heaphy, 2013) posited that such relationships are only possible in environments in which employees feel safe to take risks and/or accept personal vulnerabilities. Resilience is a

function of social interactions within teams or organizations and it is necessary for sustained engagement; however, it develops only when "members join together in meaningful ways to share information, solve problems, make sense of their experiences and provide support" (p. 179). This perspective suggests that, in order to measure employee engagement, a measurement of social connectedness or resiliency might also be needed.

Research Hypotheses

The study aimed to evaluate measures of engagement that closely reflect Kahn's (1990) conceptualization and, therefore, employed a needs-satisfaction based operationalization of the construct. Specifically, this study represented a side-by-side comparison of two needs-satisfaction based measures: the Rich Scale and the ISA Scale. Although both scales were developed based on Kahn's (1990) conceptualization, they are, as previously described, inherently different. Given these differences, it is logical to expect differences in the relationships these two operationalizations have with the studied variables of workplace stress and burnout. Further, by not using a burnout-antithesis based measure of engagement, this study sought to address some of the tensions in the scholarly literature about the relationships between burnout and employee engagement.

There were three key predictions in this study: 1) that two similarly conceptualized measures of employee engagement would evidence different relationships with workplace stress and burnout; 2) that the differences in these relationships would be revealed through an examination of each engagement measure's nomological framework (or subscales); and, 3) that the presence of social engagement improves engagement's

resiliency against certain negative forces (or against the resource loss associated with these forces) working against it (Hobfoll, 1989; Kahn, 1990, 1992, 2013). The specific hypotheses are as follows:

Hypothesis 1 predicted a negative relationship between workplace stress and both measures of employee engagement (Figure 1). This hypothesis is grounded in the intersection of Hobfoll's (1989) conservation of resources (COR) theory of stress and Kahn's (1990) theoretical conceptualization of personal engagement. The underlying premise of COR is that stress results when valued "resources" are lost or under threat of loss. Similarly, Kahn's (1990) contends that psychological availability, one of his three psychological pre-conditions of engagement, is only possible when an individual has her/her valued "resources." It follows then that the forces which consume (or threaten) resources both lead to stress and decrease the likelihood of employee engagement. Given that the measures of employee engagement are based on Kahn's (1990) conceptualization, both should evidence negative relationships with workplace stress.

H_{1a}: *Workplace stress is negatively related to employee engagement as measured by the Rich Scale.*

H_{1b}: *Workplace stress is negatively related to employee engagement as measured by the ISA Scale.*

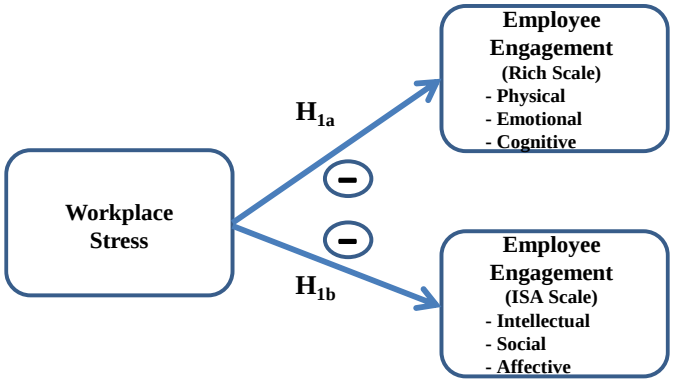


Figure 1. Conceptual Model of Hypothesized Relationships between Workplace Stress and Employee Engagement

Hypothesis 2 predicted that the relationship between workplace stress and employee engagement differs depending upon the instrument used to measure employee engagement. Specifically, this hypothesis asserts that the inclusion of the social (or interpersonal relationship) component in the ISA Scale weakens the negative relationship between workplace stress and employee engagement in comparison to the same relationship measured by the Rich Scale which excludes that dimension. This hypothesis is grounded in Kahn's (2013) contention that positive interpersonal relationships are both foundational to engagement and improve the resiliency of engagement in the face of resource demands such as workplace stress.

H_2: *The negative relationship between workplace stress and employee engagement is stronger when employee engagement is measured by the Rich Scale than when measured by the ISA Scale.*

The next two hypotheses, H_{3a} and H_{3b}, proposed that the presence of burnout has a mediation or indirect effect on the relationship between workplace stress and employee

engagement, and that the indirect effect differs depending upon the instrument used to measure employee engagement (Figure 2). Although Kahn (2013) may not have considered engagement as the opposite of or on a continuum with burnout, research suggests that the two constructs may be related (Bakker et al., 2008). This is consistent with the theoretical underpinnings of workplace stress, burnout and engagement. For example, if workplace stressors deplete valued resources which are needed for the capacity for one to engage, and the accumulation of stressors over time can lead to burnout, it is reasonable to predict that the eventual condition of burnout might explain the negative relationship between stress and engagement.

Hypothesis H_{3b} predicted that the inclusion of the social (or interpersonal relationship) component in the ISA Scale weakens the indirect effect of burnout on the negative relationship between workplace stress and employee engagement in comparison to the same relationship measured by the Rich Scale which excludes that dimension. This hypothesis is supported by Kahn's (2013) contention that positive interpersonal relationships improve the resiliency of engagement in relation to those variables that may otherwise seek to negatively affect it.

H_{3a}: *Burnout fully mediates the negative relationship between workplace stress and employee engagement as measured by the Rich Scale.*

H_{3b}: *Burnout partially mediates the negative relationship between workplace stress and employee engagement as measured by the ISA Scale.*

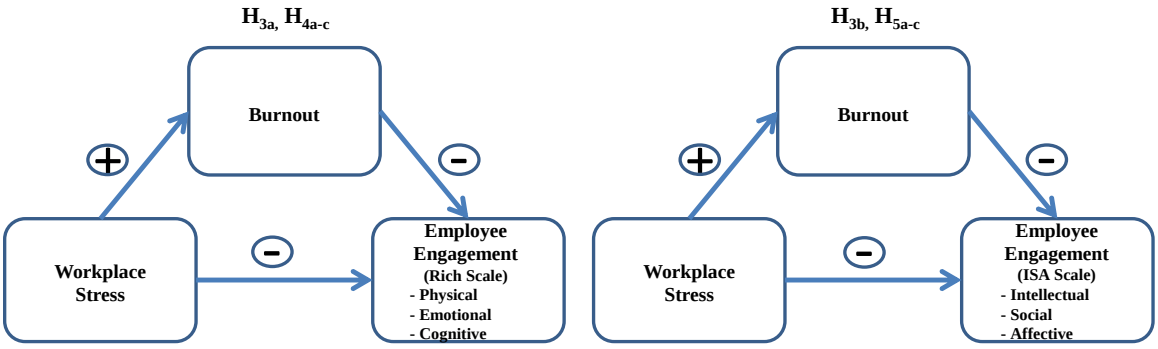


Figure 2. Conceptual Model of Hypothesized Relationships between Workplace Stress, Burnout and Different Measures of Employee Engagement

The final set of hypotheses, H_{4a}-H_{4c} and H_{5a}-H_{5c}, predicted that the differences in the relationships between workplace stress, burnout and employee engagement can be found at the domain or dimensional level of the employee engagement operationalizations and related measurement instruments.

H_{4a}: *Burnout fully mediates the negative relationship between workplace stress and physical employee engagement as measured by the Rich subscale.*

H_{4b}: *Burnout fully mediates the negative relationship between workplace stress and emotional employee engagement as measured by the Rich subscale.*

H_{4c}: *Burnout fully mediates the negative relationship between workplace stress and cognitive employee engagement as measured by the Rich subscale.*

H_{5a}: *Burnout fully mediates the negative relationship between workplace stress and intellectual employee engagement as measured by the ISA subscale.*

H_{5b}: *Burnout partially mediates the negative relationship between workplace stress and social employee engagement as measured by the ISA subscale.*

H_{5c}: *Burnout fully mediates the negative relationship between workplace stress and affective employee engagement as measured by the ISA subscale.*

Overview of the Pilot and Design of This Study

The following section begins with a brief description of a pilot study which was conducted in 2013 and whose findings influenced the design of this research study (see detailed findings from the pilot study in Chapter 3, pages 91-102). The section then presents an overview of the design for this quantitative study and includes a brief discussion of the population and sample, data collection procedures, data analysis procedures, issues associated with reliability and validity, and the study's limitations.

Overview and Influence of Pilot Study Findings

A pilot study utilizing a relatively small sample size (n=67) and aimed at testing the plausibility of the research hypotheses in a healthcare-related company was conducted in 2013. Although the results of this pilot study had little generalizability, they did confirm some of the hypothesized relationships and were used to inform this research study. Specifically, the findings supported the predicted negative relationship between workplace stress and employee engagement (as measured by the ISA Scale) and revealed that burnout played a mediating role in this relationship.

As in this study, two different needs-satisfaction based employee engagement measurement instruments were used in the pilot: the May Scale (May et al., 2004) and the ISA Scale (Soane et al., 2012). However, the pilot study failed to show significant relationships between the independent variables and some of the May subscales. Given this outcome and the findings from other studies which suggested challenges with the

reliability of the May subscales (Viljevac et al., 2012), this study substituted the Rich Scale (Rich et al., 2010) as a similarly conceptualized, but alternative, measure of employee engagement.

Additionally, the pilot study employed the eight item exhaustion dimension from the OLBI (Demerouti et al., 2002) as its measure of burnout. In order to avoid the potential for confusion that may arise through the use of a burnout measure that has also been used to measure engagement through its reverse scores (Demerouti & Bakker, 2007), this study substituted the BMS, a shorter version of the BM, as another measure that operationalizes an exhaustion-based conceptualization of burnout (Malach-Pines, 2005; Pines & Aronson, 1988).

Design of This Study

This research study was an *a priori* theory-based, quantitative design. To test the research hypotheses, responses from a cross-section of IT professionals working in U.S. community hospitals were collected. To address one of the main goals of the study, only IT professionals who were working in community hospitals that were implementing EHRs were sampled. The choice of a quantitative study design was appropriate given that existing theory drove data collection, and the relationships between the variables were tested to see how the application of different employee engagement measures impacts the results (Bryman & Bell, 2011). Further, the study aimed to produce findings and conclusions that are generalizable to the broader population of IT professionals working in U.S. community hospitals (Bryman & Bell, 2011).

Population and Sample

The context for this study was the stress-charged environment of IT professionals working on EHR implementations in community hospitals in the United States. Therefore, the population to be studied represents the approximately 100,000 IT professionals working in the almost 5,000 U.S.-based community hospitals or hospital systems (AHA, 2013). This particular population was chosen because the IT professionals working to support EHR-related technologies and processes represent a fairly homogenous group across the U.S. Regardless of the hospital for which they work, they are confronted with similar technologies, clinical workflows and objectives for implementation (Blumenthal & Tavenner, 2010). They are also facing the same time pressures, working with the same complement of end-users, and experiencing many of the same stress factors (Anthony et al., 2014).

The study sought to recruit respondents from a quota sample of hospitals that generally reflects the overall U.S. community hospital population. U.S. community hospitals are somewhat unequally represented in terms of inpatient beds—a common metric of relative size. In addition, many small hospitals are actually members of a larger hospitals system and, in those cases, the IT departments are typically organized at the corporate level, not at the individual hospital level. Similarly, the geographic distribution of U.S. hospitals is also unequal (AHA, 2013; AHD, 2013; CDC, 2011). Nevertheless, community hospitals or hospital systems were targeted to reflect a representative quota sample in terms of size and geographic location.

Community hospitals or hospital systems were identified for inclusion in this study based on the confirmation that EHR implementations were actively underway. This confirmation occurred through discussions with Chief Information Officers (CIOs) or other senior IT executives at healthcare IT-related conferences such as CHIME (College of Healthcare Information Management Executives) or HIMSS (Healthcare Information Management and Systems Society). Recent studies confirmed that 44% of all U.S. hospitals had basic EHRs installed ("Health information technology in the United States: Better information for better care," 2013).

The minimum number of survey respondents required for this study was 160, but the study sought to obtain approximately 350 respondents. The minimum sample size was determined by reviewing the measured effect sizes from other engagement-related studies and from targeting a statistical power level of .8 with a significance level of .05 (Friedman, 1982). The effect sizes from actual studies in which engagement was an outcome variable ranged from .35 to .78. The 2013 pilot study revealed a measured effect size of .4, so in consideration for a more rigorous test, the lower range of .4 was used to determine the minimum sample size. Using the GPower 3.1 tool, the minimum sample size was calculated to be 44, but an additional 100 responses were needed to support the testing requirements of structural equation modeling (Hair, Black, Babin, & Anderson, 2010). Further, another 10% was required to account for the possibility of unusable or incomplete survey responses leading to the total minimum sample size of 160. Nevertheless, to improve the potential for better generalizability, the study sought

approximately 350 respondents from U.S. community hospitals working on EHR implementations.

Seventy-four community hospitals (or hospital systems), based upon sizes and locations that approximated the U.S. hospital market, were identified for potential participation. The average community hospital employs approximately .2 IT professionals per hospital bed (Hersh & Wright, 2008). Response rates by individuals for surveys used in organizational research typically averages 50% and is often higher for online surveys (Baruch & Holtom, 2008). This study estimated a 35% response rate which meant that recruiting approximately 1,000 IT professionals should yield the desired number of 350 participants. Assuming that approximately 40 of the 74 hospitals actually participated and given their relative sizes and the staffing ratio of .2/bed, it was estimated that approximately 1,140 IT professionals would be available to recruit for survey participation.

Data Collection Procedures

The CIOs of these hospitals or hospital systems were asked to approve, in writing, the willingness of their organizations to participate in this research study. Individual survey participants were then recruited via email from the entire IT employee populations of the participating hospitals. An email, drafted by the researcher (Appendix A), was sent from the CIOs to all of their IT employees with a request to participate in the study. A follow-up email was sent two weeks after the initial email. The email contained a link to the web-based survey instrument and, to reduce the potential for bias due to social desirability (Tsai & Ghoshal, 1998), it informed potential study participants that 1) taking

part in the web-based survey was completely voluntary; 2) no incentives were provided for participation; 3) all survey responses were confidential; and, 4) all results would be reported at aggregate levels (Bryman & Bell, 2011).

The survey began with opinion questions related to the constructs under examination and were derived from the published and empirically validated instruments listed below (complete scales are included in Appendices C-F). These questions were presented and ranked on Likert scales ranging from "Strongly Disagree" to "Strongly Agree" or "Never" to "Always". A few questions were scored on the reverse scale (in accordance with the original instrument developers' design) and no free text responses were collected. In order to minimize the risk of bias due to common method variance, the questions that measure the dependent variables (employee engagement) were positioned first in the survey (Podsakoff, MacKenzie, Jeong-Yeon, & Podsakoff, 2003).

- Workplace Stressors Assessment Questionnaire – 22 items (α=.95). The choice of this instrument was determined by its underlying underpinnings in the COR theory of stress (Hobfoll, 1989) and its psychometric development with high-tech employees (Mahmood et al., 2010).
- The Burnout Measure, Short Version (BMS) – 10 items (α=.85). As a shorter version of the widely-used Burnout Measure (BM), this instrument operationalizes an exhaustion-based conceptualization of burnout (Malach-Pines, 2005).

- Rich Engagement Scale – 18 items (α=.95). This instrument represents both a needs-satisfaction and multi-dimensional conceptualization and includes physical, emotional and cognitive dimensions (Rich et al., 2010).
- ISA Engagement Scale – 9 items (α=.9). This instrument consists of intellectual and affective domains that are similar to those found in the Rich Scale but also includes a social dimension reflecting the researchers' belief, also in accordance with Kahn (2007b), that employees need to work positively and collectively together and share similar values, goals and attitudes with their coworkers (Soane et al., 2012).

The survey concluded with general demographic and descriptive questions which served as control variables. These questions, all identified in previous studies as potentially influencing the hypothesized relationships, included gender, age, organizational tenure, education, client interaction, and supervisory status. As a quota sample of community hospitals reflecting the overall population of U.S. community hospitals in terms of inpatient bed size and geographic location was sought, control variables related to bed size and location were collected. Although all community hospitals must implement an EHR that has been certified against federal standards, another control variable related to the actual EHR system being implemented was also captured (Blumenthal & Tavenner, 2010).

Data Analysis Procedures

Collected data were reviewed for completeness and for the presence of any outliers. The data were also validated and the analysis began with a review of the

descriptive statistics including means, standard deviations and zero-order correlation coefficients (J. Cohen, Cohen, West, & Aiken, 2003; Hair et al., 2010). Prior to performing any statistical analyses, the following assumptions were tested and verified: reliability of the scales and subscales, linearity of the relationships between the independent and dependent variables, absence of multicollinearity, homoscedasticity, normality of the dependent variables, and independence of the independent variables. These assumptions are fundamental to multivariate analysis and are designed to ensure that the potential for "distortions or bias" (p. 70), inherent when a large number of variables is analyzed, is limited (Hair et al., 2010).

Further analysis was conducted in a number of phases. First, measurement models were defined *a priori* in order to determine how well the observed items in each measurement instrument served as indicators of the latent variables they were intended to measure (Joresborg & Sorbom, 1993). These models were analyzed using confirmatory factor analysis (CFA) in LISREL (version 9.1) and in accordance with (Hair et al., 2010). Next, the relationships between workplace stress, burnout and the two operationalizations of employee engagement were tested by a number of statistical methods including correlation analysis, exploratory factor analysis and multiple hierarchical regression in SPSS (version 22), maximum likelihood structural equation modeling (SEM) in LISREL (version 9.1) and bootstrapping in SPSS using the INDIRECT macro developed by K. J. Preacher and Hayes (2004).

SEM was particularly appropriate for use in this study because it minimizes the impact of measurement error (Schumacker & Lomax, 2010), remains robust in the

presence of multicollinearity and supports tests for bias due to common method variance (Conway & Lance, 2010; Podsakoff et al., 2003). The various structural models were developed, analyzed and compared in order to identify any statistically significant differences in the underlying nomological frameworks. Finally, tests for the indirect effect of burnout on the relationships between workplace stress and employee engagement were conducted in accordance with the multi-step approach of Hair et al. (2010) using SEM and bootstrapping analysis (K. J. Preacher & Hayes, 2004).

Reliability and Validity

The stability and internal reliability of the study's findings were attained through the use of empirically tested measurement instruments whose Cronbach's alpha scores were .7 or better (Bryman & Bell, 2011). Further, a common web-based survey instrument and instructions were administered to all study participants so as to minimize any concerns with inter-observer consistency (Bryman & Bell, 2011). The face validity of the four measurement instruments was also reasonable. The risk of common method bias was tested by means of both the Harman single-factor test and the common latent factor test (Podsakoff et al., 2003), and the risk of non-response bias (both from non-participating hospitals and from non-participating IT employees) was tested using independent samples *t*-tests (J. Cohen et al., 2003).

Internal and convergent validity was established by using CFA to calculate composite reliabilities, communalities, and the percentage of average variance extracted for all of the constructs (Hair et al., 2010). The findings from the 2013 pilot study revealed high bivariate correlations between workplace stress and burnout, and this is

consistent with the literature which suggests that stress and burnout are highly interrelated (Gorgievski & Hobfoll, 2008). But, to address the risk that the results of the study might be influenced by the presence of multicollinearity, the discriminant validities of all of the constructs were confirmed by means of CFA and in accordance with Hair et al. (2010).

The intent of this study was not to examine the between-organizational effects on the variables. However, in order to control for the possibility of bias due to multi-level effects from survey respondents who were nested in different hospital organizations, intraclass correlation coefficients (ICC1 and ICC2) were calculated for each hospital or hospital system that participated in the study (McGraw & Wong, 1996; Shrout & Fleiss, 1979). These coefficients, a measure of interrater reliability, calculate the proportion of variance that is attributable to the survey respondents themselves. If the ICCs between participating organizations are non-significant, the potential for bias due to multi-level effect is low (Landers, 2011; Shrout & Fleiss, 1979).

Significance of the Study

This study and its findings fit naturally into the scholarly examination of HRD-related concerns regarding the conceptualization and operationalization of engagement in the context of the academic and business communities. Specifically, this study contributes to scholarly literature, theory and practice regarding employee engagement in three major ways: 1) by evaluating the relationship between workplace stress, burnout and engagement not through the use of a burnout-antithesis or job satisfaction framed perspective of engagement, but through the lens of Kahn's (1990) conceptualization; 2)

by examining the measurement of engagement in the context of organizational change (specifically, the implementation of EHRs) within the healthcare industry; and, 3) by comparing two similarly conceptualized measures of employee engagement in order to understand the differences in their underlying nomological frameworks and to clarify the interpretation of their meanings. These contributions are explained below.

There is abundant research in many organizational contexts that positions employee engagement on the same continuum as burnout, antipodean to burnout, or as analogous to job satisfaction (Demerouti & Bakker, 2007; Harter, Schmidt, Agrawal, & Plowman, 2013; Maslach & Leiter, 1997; Robinson et al., 2004; Schaufeli et al., 2006). However, disagreement among scholars about these perspectives is driving an increasing interest in measuring Kahn's (1990) needs-satisfaction based conceptualization of engagement and better understanding the relationships that his conceptualization has to other variables (Fletcher & Robinson, 2013; Shirom, 2004; Shuck, 2011; Shuck et al., 2012). Further, through this examination, there is an opportunity to evaluate the relationship between engagement and burnout differently than in previous studies—not as antipodean but as an independent condition that may affect the relationship between workplace stress and engagement. The findings from this study aimed to clarify some the tensions in the literature arising from the agreement (or disagreement) of various scholars as to the nature of the relationship between burnout and engagement (Fletcher & Robinson, 2013; Shuck, 2011).

HRD practitioners are particularly interested in engagement-related concerns in healthcare—an industry which has provided and continues to provide great fodder for the

study of organizational change and the consequential impact on employee engagement (Anthony et al., 2014; Halbesleben, 2008c; Laschinger & Leiter, 2006; Small & Small, 2011; Wagner, 2006). Some argue that the uncertainties and changes currently facing hospitals and their employees—pressure to downsize, cultural impact of mergers, adoption of disruptive technologies, reorganization of care delivery processes—are unprecedented and are all underway while hospitals must simultaneously maintain patient safety and care delivery standards (Rogers, 2005). In fact, an Institute of Medicine study specifically warned that many of the ongoing restructuring practices and related change initiatives are resulting in "serious threats to patient safety" ("Keeping patients safe: Transforming the work environment of nurses," 2004, p. 4). Just one of these challenges relates to the nationwide initiative to improve clinical outcomes and reduce costs through the adoption of EHRs. In fact, the U.S. healthcare industry is in the midst of a transformational change that will likely span decades and impact every operational process (Mathews, 2011).

The organizational change literature suggests that the "content of organizational change is one thing, and the process is another" (Burke, 2011, p. 25) meaning that content and process are both critical, but they are not the same. The best laid visions, plans and incentives are still completely dependent upon those individuals charged with leading, facilitating and/or and implementing change (Beitler, 2006). It is both intuitive and the contention of numerous scholars that engaging the organization's workforce will be one of the key human resource-related strategic imperatives necessary to successfully accomplish these change initiatives (Albrecht, 2010; Halbesleben, 2008b; Kahn, 2010).

Understanding how to measure and operationalize employee engagement in practice would be a key tool for HRD practitioners and workforce mangers charged with facilitating this imperative.

Understanding the role that engagement plays in the workforces of hospitals (or in any organizational setting) presumes a clear understanding of the meaning behind the measurement of employee engagement in relation to other variables. However, this meaning requires an equal understanding of what the measures of employee engagement are actually measuring and what the outcomes of such engagement measures are suggesting in terms of workplace practice. As Halbesleben (2008b) pointed out, "the convergence of interests from healthcare practitioners and researchers could lead to significant advances in understanding the role that engagement plays … [sic] including more development and testing of theory, more development of measurement tools, expansion of international and multidisciplinary research and increase in intervention research" (p. 217). As such, one of the most important contributions this study can make may be further clarification of two similarly conceptualized measures of a construct that is vital to healthcare workforces and thus to the future of U.S. hospitals.

Further, if, as predicted, a more complete understanding of employee engagement is found at the domain (or dimensional) levels of the instruments that operationalize the construct, then this study's findings may suggest interesting implications for both the theory and practice of employee engagement.

Limitations

Although efforts to ensure a rigorous and generalizable study were made, some limitations are noteworthy. These limitations include the use of self-report data which introduced the possibility of bias due to common method variance (Podsakoff et al., 2003). However, Spector (1987) suggested that this issue is more problematic when using poorly designed measurement scales, and Doty and Glick (1998) suggested that whereas common method variance may introduce some bias, it is rarely significant enough to affect the overall findings of research studies. This risk appears to be minimal given that 1) all the scales evidenced high reliability in prior studies; 2) the survey questions in the study were intentionally ordered to reduce the potential for bias; 3) each of the four scales has different response options; and 4) the risk of this bias was tested via the Harmon single-factor test and the common latent factor test (Conway & Lance, 2010; Podsakoff et al., 2003).

As a cross-sectional study, there is some risk that other explanations for the observed relationships are possible although this was mitigated by the fact that the hypothesized relationships were theory-based (Bryman & Bell, 2011). There was also a risk of unintentional bias from the survey respondents as CIOs or other IT executives sponsored their hospitals' participation and assisted in the recruitment of their staffs. Efforts to minimize this risk were employed including guarantees of voluntary participation and complete confidentiality of all responses.

The study's survey participants are considered to be a random sample because all IT professionals in each participating hospital were invited to participate, but the use of

quota sampling for the recruitment of participating hospitals introduced a potential for bias as this is a non-random sampling approach. However, as the categories targeted by this sampling approach were largely objective (that is, not based upon the researcher's perceptions or observations), the risk of this bias is limited (Bryman & Bell, 2011). The potential for non-response bias was also tested and found to be low, but this risk cannot be completely ruled out. As the survey respondents were employed and thus nested in different hospital organizations, there is a risk of bias due to multi-level effect. This risk was mitigated by the relative homogeneity of the population under study and the consideration of certain organization-level control variables, but was examined through the calculation of intraclass correlation coefficients (Shrout & Fleiss, 1979).

The Workplace Stressors Assessment Questionnaire is a new instrument designed specifically to measure stress among high-tech professionals (Mahmood et al., 2010). Similarly, the ISA Scale is also new and has not been tested since its original psychometric development (Soane et al., 2012). The reliability of both instruments was very high in initial testing (α=.95 and .91, respectively), and the application of these instruments was appropriate for this study. Although this study provides further evidence of the psychometric soundness of these two measures, there is some risk as to their generalized validities.

This study also utilized the BMS as its measure of burnout specifically because its authors did not intend that it also be used to measure the opposite of engagement (Malach-Pines, 2005; Pines & Aronson, 1988). However, this measure is less frequently cited in the scholarly literature (Schaufeli & Buunk, 2002). Since most empirically tested

burnout measures are based largely upon emotional exhaustion, it is likely that this study's findings would be similar with other burnout measures (such as the OLBI or the MBI) that have been used to measure engagement through their reverse scores. Nevertheless, the use of the BMS represents another limitation of this study.

One of the major assumptions of this study was that the relationship between workplace stress and employee engagement is linear. However, there may be certain circumstances in which workplace stress and engagement exhibit a curvilinear relationship (Bryman & Bell, 2011). For example, it is possible that lower levels of stress may evidence a positive relationship with employee engagement whereas higher levels exhibit a negative relationship (Nelson & Simmons, 2003). This study did not consider the possibility of a curvilinear relationship between these variables, but this phenomenon may represent an interesting topic for future research and study.

Finally, the population of this study encompassed IT professionals working to implement EHRs in U.S.-based community hospitals. Therefore, the findings from this study can be generalizable to IT professionals working in this context, but future researchers should examine whether the same similarities and/or differences in the examined relationships would hold among other occupational groups and among those working in other industries, other jobs, different countries and/or under different circumstances.

Definition of Terms

Burnout – Burnout occurs as a consequence of "prolonged response to chronic emotional and interpersonal stressors on the job" (Maslach et al., 2001, p. 397) and is

defined as “a state of physical, emotional and mental exhaustion caused by long-term involvement in situations that are emotionally demanding” (Pines & Aronson, 1988, p. 9).

Burnout Measure (BM) – The BM is a 21 item self-report measurement of burnout that sought to operationalize the definition of burnout as “a state of physical, emotional and mental exhaustion caused by long-term involvement in situations that are emotionally demanding” (Pines & Aronson, 1988, p. 9).

Burnout Measure, Short Version (BMS) – The BMS is a shorter measure of the exhaustion-based BM (Malach-Pines, 2005). This 10 item measure evidenced high levels of validity and reliability, and its results were consistent with those of the BM (Malach-Pines, 2005).

Clinical Professionals – Clinical professionals or *clinicians* are hospital workers who are engaged in the provision or supervision of patient care or care-related services. Occupations include registered nurse, licensed vocational nurse, nurse aid, physician, hospitalist, intensivist, laboratory technician, microbiologist, radiology technician, respiratory therapist, physical therapist, pharmacist, and pharmacy technician (AHA, 2012b).

Community Hospitals – Community hospitals are defined by the American Hospital Association as the approximately 5,000 non-federal, short-term or other special (e.g., eye, ear, nose, and throat; rehabilitation; orthopedic) hospitals (AHA, 2013). As community hospitals represent that vast majority of U.S. hospitals, the terms

community hospitals and *hospitals* were used synonymously for the purposes of this study (AHA, 2012a).

Electronic Health Records (EHR) – An EHR is a longitudinal electronic record of patient health information that includes patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow, and has the ability to generate a complete record of a clinical patient encounter including evidence-based decision support, quality management, and outcomes reporting ("Electronic Health Record," 2012).

Engagement – Kahn's original definition of engagement was the "harnessing [of] organization members' selves to their work roles" (p. 694). Shuck and Wollard offered a more recent definition as "an individual employee's cognitive, emotional and behavioral state directed toward desired organizational outcomes" (2010, p. 103). According to Christian et al. (2011), employee engagement refers to an individual's connection with work tasks (rather than one's attitude towards the job or organization) and also refers to one's investment of "personal resources" or the simultaneous investment of one's self toward the work role in the form of cognitive, affective, and physical energies. Some nuances in the different terms used for engagement have been identified (including *engagement*, *employee engagement*, *job engagement*, *work engagement* and *personal engagement*); however, this study referenced this concept by the terms *engagement* or *employee engagement*.

Gallup Work Audit – This proprietary 12 item instrument (also called the Q12) was originally developed over a decade ago to measure job satisfaction (Harter et al., 2002). This instrument, in wide use in the business community, includes comparative data on over 8,000 companies and has also been suggested as an alternative measure of employee engagement (Harter et al., 2013).

Healthcare Industry/Organizations – The U.S. healthcare industry is a segment of the U.S. economy encompassing those organizations who provide goods and services used in the treatment of patients requiring preventive care, treatment services, rehabilitative and/or palliative care. In 2012, it represented almost 18% of the U.S. Gross Domestic Product ("Health care industry," 2013).

Hospitals – See "Community Hospitals".

Hospital System – A hospital system includes two or more community hospitals, typically under common ownership, control and/or management (AHA, 2012a).

Information Technology (IT) Professionals – This group of professionals includes any hospital worker primarily engaged in the installation, maintenance, support and supervision of the hospital's information systems and related technologies. Occupations include hardware technician, network administrator, software analyst, system analyst, system engineer, data/system architect, software engineer, programmer, database administrator, IT project manager, informaticist, and IT help desk (HIMSS, 2012).

ISA Scale – The ISA Scale represents a needs-satisfaction based measure of employee engagement developed in 2011. The scale contains nine questions (Appendix F)

grouped into three dimensions: intellectual engagement, social engagement and affective engagement (Soane et al., 2012).

May Scale – The May Scale represents the first needs-satisfaction based measure of employee engagement that attempted to operationalize Kahn's (1990) construct of engagement. Developed in 2004, the scale contains thirteen questions grouped into three dimensions: cognitive engagement, emotional engagement and physical engagement (May et al., 2004).

Maslach Burnout Inventory (MBI) – The MBI is a 16 item, proprietary measure of burnout developed in the mid-1990s and based on Maslach et al.'s (1996) conceptualization of burnout. The instrument's dimensions of exhaustion, cynicism and personal efficacy have more recently been posited as reflecting the opposite of engagement and thus, the reverse answers to the instrument can be used to measure engagement (Maslach et al., 2001).

Meaningful Use – The term meaningful use was developed by the Center for Medicare and Medicaid Services and refers to a set of proscribed objectives for the use of EHRs that are used to determine whether a hospital or physician has met certain requirements that might qualify them for incentive payments under the HITECH Act ("American Recovery and Reinvestment Act of 2009," 2009).

Non-Clinical Professionals – This group of professionals includes any hospital worker not engaged in the provision or supervision of patient care. Occupations within this group include office and administrative support, management, building and grounds cleaning and maintenance, food preparation and serving, community and

social services, business and financial operations, equipment installation and maintenance, and information systems/technology services (AHA, 2012b).

Oldenburg Burnout Inventory (OLBI) – The OLBI (Demerouti & Bakker, 2007) is a widely-accepted measurement that operationalizes the conceptualization of burnout which underpins this study (Maslach et al., 2001). Researchers independently validated the English translation version in the U.S., and the inclusion of questions specifically related to exhaustion are consistent with the literature on burnout (Demerouti & Bakker, 2007; Demerouti et al., 2002; Halbesleben & Demerouti, 2005; Maslach & Leiter, 1997; Maslach et al., 2001). The OLBI consists of 16 questions, both positively and negatively framed, that include the specific dimensions of exhaustion (Appendix H) and disengagement (Demerouti & Bakker, 2007; Demerouti et al., 2010).

Positive and Trusting Interpersonal Relationships – Kahn (2005) described positive, trusting relationships as "resilient" and only possible in environments in which employees feel safe to take risks and/or accept personal vulnerabilities. Interpersonal trust has been shown to improve the effectiveness of the coordinated efforts of interdependent employees and is also linked to numerous positive organizational outcomes (McAllister, 1995).

Psychological Safety – Kahn (1990) defined psychological safety as the ability "to show and employ one's self without fear of negative consequences to self-image, status, or career" (p. 708).

Rich Scale – The Rich Scale represents a multi-dimensional, needs-satisfaction based measure of employee engagement developed in 2010. The scale contains eighteen questions (Appendix E) grouped into three dimensions: physical engagement, emotional engagement and cognitive engagement (Rich et al., 2010).

Saks Scale – The Saks Scale is a multi-dimensional operationalization of Kahn's (1990) needs-satisfaction conceptualization of engagement. It was developed in 2006 and includes 11 items split into the two dimensions of job engagement and organizational engagement (Saks, 2006).

Workplace Stress – Stress occurs when there is a loss, or threat of loss, of an individual's valued resources. These resources can include objects, energies, conditions or personal feelings (Hobfoll, 1989). For the purposes of this study the terms *workplace stress, job stress and occupational stress* were used synonymously.

Workplace Trust – Trust, according to Mayer et al.'s (1995) conceptualization, is defined as the "willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control the other party" (p. 712).

Utrecht Work Engagement Scale (UWES) – The UWES is a burnout-antithesis framed measure of work engagement developed in 2002. This widely-used scale includes 17 items organized into the three dimensions of vigor, dedication and absorption (Schaufeli et al., 2002).

Summary of the Chapter and Organization of the Dissertation

Chapter 1 provided the background to the problem, a statement of the problem and the purpose of this study. It presented the theoretical and conceptual underpinnings for the study and the research hypotheses. An overview and influence of a pilot study conducted in 2013 was then discussed. The design of this study, its significance to both theory and practice, and its limitations were presented. The chapter concluded with a definition of terms that are used throughout this document.

Chapter 2 presents a review of the literature domains relevant to this research study. These domains of literature include workplace stress, burnout, employee engagement, and positive interpersonal relationships at work. A review of engagement measurement and the consequences of different operationalizations is also discussed. Given the context of this study, the chapter presents an overview of some of the change-related forces currently present within the U.S. healthcare industry. The chapter concludes with a summary.

Chapter 3 presents the research hypotheses. The findings from a pilot study conducted in 2013 which tested the plausibility of the hypotheses and influenced the design of this study are also presented. The chapter then outlines the design of this study and presents a discussion of the population and sample, details about the measurement instruments, the approaches to data collection, the approaches to data analysis, and issues associated with reliability and validity. It concludes with a summary.

Chapter 4 presents the results from the analysis of the data collected in support of this study. The chapter begins with a discussion of the demographics associated with the

participating hospitals and IT professionals. It continues with a review of the assumptions, reliabilities and validities that were tested and describes how these elements were tested and evaluated. The approaches to testing the hypothesized relationships are presented followed by the detailed examination of these relationships. The chapter concludes with a summary.

Chapter 5 presents a discussion of the findings and conclusions from the study. It begins with a brief summary of the study. It then discusses the findings in relation to the existing literature based upon the data analysis in Chapter 4. Conclusions and implications for theory are presented followed by implications for practice within healthcare IT, the broader business context, and for human resource development. A number of recommendations for future research are discussed, and the chapter concludes with a summary.

Chapter 2 – Review of Literature

Introduction

This chapter reviews the literature domains relevant to exploring various operationalizations of employee engagement through an examination of their relationships to workplace stress and burnout. The review is organized into seven sections. The first section reviews the literature relevant to workplace stress in general, within the context of the healthcare industry, and as it relates to IT professionals. The next section reviews the literature relevant to burnout and the intentions of three major burnout measurement instruments. In the third section, the literature relevant to employee engagement and its various conceptualizations, both in general and within the context of the healthcare industry, is presented. The fourth section reviews the concept of positive interpersonal relationships at work in relation to employee engagement. The fifth section reviews the literature relevant to differences in the nomological framework of employee engagement and the related consequences of those differences. As the context for this study is the stress-charged environment of IT professionals working in U.S. hospitals that are implementing electronic health records (EHRs), the sixth section presents the literature relevant to the changing landscape of the U.S. healthcare industry and, in particular, the impact of EHRs on the workforces of community hospitals. Finally, the last section presents a summary of the chapter.

To conduct this literature review, the following databases were searched: Business Source Complete, Academic Source Complete, Psych Info, Emerald, PubMED/MedLine and ProQuest. The following search terms were used (some in combination and/or in various plural forms): stress, job stress, workplace stress, conservation of resources, burnout, burnout measurement, exhaustion, engagement, employee engagement, personal engagement, job engagement, work engagement, engagement measurement, coworker trust, supervisor trust, positive interpersonal relationships, healthcare, hospital, community hospital, electronic health records, information technology professional, information systems professional, clinical professional, clinician, nurse, nursing, physician and the U.S. healthcare industry. The reviewed documents (generally published between 1985 and 2014) included peer reviewed journal articles, empirical studies, meta-analyses, literature reviews, books, dissertations, masters' theses, industry publications and governmental websites.

Workplace Stress

Early conceptualizations of workplace stress grew out of studies in the biological and physical sciences. Sikora, Beaty and Forward (2004) considered employee and organizational stress as an evolution from two primary models of physiological stress: Seyle's (1946) general adaptation syndrome (GAS) and McEwen's (1998) conceptualization of allostasis. GAS represents the human body's reaction and adaptation to shock or stress and consists of the following phases: shock, alarm, resistance and collapse. Although collapse is not necessarily an eventuality, the demands of the stress itself, the environment and time will determine the extent to which the body

can adapt well enough to avoid this last phase. Similarly, allostasis represents the body's ability to match the demands of the stress to a physiological response. McEwen's (1998) research studied the body's inability to remain adaptive as a result of "chronic overactivity or underactivity" or failure to "shut off after stress" (p. 171). Later conceptualizations presented stress as 1) the imbalance between an individual's perceptions of stress and the perceptions of the resources that individual has to cope with that stress (McGrath, 1970); 2) the relationship between stressful stimuli and an individual's appraisal of the stressor (Spielberger, 1972); and, 3) stress as a stimulus (rather than as a response) (Elliott & Eisdorfer, 1982).

Sikora et al. (2004) expanded those concepts to today's work environments which are continually evolving and thus increasingly reflective of stress events that are not singular, linear or sequential, but continuous, overlapping and asynchronous. They posited two critical points: 1) that "if numerous stressors occur simultaneously or in rapid succession, the individual likely remains in a generalized alarm state, and after sustained resistance or vigilance, a once adaptive response becomes exhausted" (p. 29); and, 2) that the "magnitude and rapidity of organizational and technological changes at some point preclude adaptation" (p. 29). The outcome of employees who found themselves in this state was characterized as non-responsive and/or non-productive or, in other words, disengaged.

In the 1990s, conservation of resources (COR) theory emerged as a new and now widely-accepted conceptualization of work-related stress (Hobfoll, 1989). Clarifying what he believed were ambiguous conceptualizations of stress in the workplace, Hobfoll

based this theory on premise the individuals have "an innate as well as learned drive to create, foster, conserve and protect the quantity and quality of their resources that are key to survival and well being" (Gorgievski & Hobfoll, 2008, p. 8). Resources (Figure 3), as posited by Hobfoll (1989), include the following:

- Objects such as a private office or other physical, tangible items which, if possessed, are valued in some way;
- Conditions such as seniority or positive relationships which are important if they are valued to the individual;
- Personal characteristics such as mental models, world views and social support structures which may aid in one's resilience to stress; and,
- Energies such as time, money and knowledge—all of which are valued and may be used to acquire other resources.

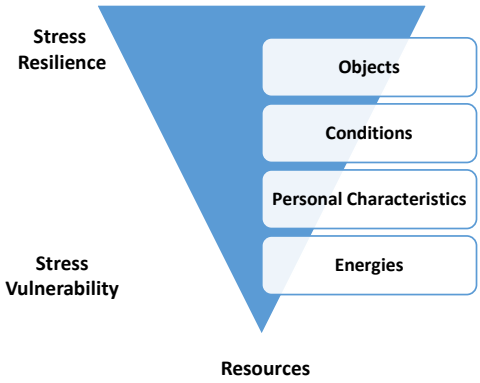


Figure 3. Hobfoll (1989) COR Theory

Under COR theory, stress occurs when 1) individuals perceive that their key resources are at risk; 2) key resources are actually lost; and/or, 3) individuals are unable

to replenish their key resources after a loss or investment of those resources (Hobfoll, 1989). Recently, Hobfoll (2011) reflected on three additional considerations: 1) that resource loss in terms of both importance and speed is disproportionate to resource gain (meaning that the actual or perceived threat of resource loss has a stronger negative influence the anticipation of resource gain); 2) that individuals will invest in resources to hedge against loss implying that those with fewer resources are more vulnerable to additional resource loss; and, 3) that resources can be pooled and shared within and across organizational structures suggesting that organizations which successfully create robust sets of resources can also mitigate against potential resource loss or stress factors.

Numerous empirical attempts to operationalize COR have successfully correlated resource loss to various job demand factors such as workload, role conflict/ambiguity, lack of supervisory support, and lack of self-regulatory activity (Schaufeli & Buunk, 2002). For example, in the job-demands resources model, the presence of high workload demands (studied in terms of hours worked, relative percentage of client contact, and criticality of client problems) was positively correlated with resource depletion and emotional exhaustion because meeting those demands requires an investment of resources (Demerouti et al., 2001; Lee & Ashforth, 1996).

Similarly, role conflict, in which individuals perceive conflicting demands at work (such as IT professionals working to meet federally mandated deadlines in order to maximize federal incentive dollars while trying to ensure the adequacy and thoroughness of their testing efforts), role ambiguity, in which individuals perceive they lack the skills or information to adequately do their jobs (such as IT professionals working to optimize a

care delivery process), and role-stress fit, in which job roles become misaligned with expected stressors (such as IT professionals facing the wrath of physicians who are frustrated with new federal requirements), also represent resource losses and were correlated with feelings of emotional exhaustion and depersonalization (LeRouge et al., 2006; Pfennig & Husch, 1994; Schaufeli & Buunk, 2002) .

In the demands-control model, the lack of supervisory support and the lack of self-regulatory activity (as in less individual autonomy, flexibility or ability to make decisions at work) both reflect stressors as conceptualized by Hobfoll (1989) and evidenced positive correlations with emotional exhaustion, depersonalization and reduced personal accomplishment (Karasek, 1979; Lee & Ashforth, 1996). Similarly, the efforts-rewards imbalance model considers stress as a consequence of the imbalance between the efforts expended by an employee and the relative reward (or resources) received relative to that effort (Siegrist, 1996).

Importantly, these studies supported Hobfoll's (1989) premise that the loss or threat of loss of resources is more significant in terms of stress than is resource gain. Whereas the gains associated with strong supervisory support, work flexibility and positive interpersonal relationships at work, for example, hedged against the losses associated with high workloads and/or role conflict, the effect of those losses or threat of those losses appeared to be more influential in terms of an employee's perception of stress and his/her behavior as a consequence of that stress (Lee & Ashforth, 1996).

COR remains among the most cited theories for understanding workplace stress (Halbesleben, 2006, 2008c). Current conceptualizations of stress—that it results from a

temporary imbalance between job-related demands and the personal resources (physical and emotional) available to an individual at any given point in time (Schaufeli & Buunk, 2002), and that it reflects a multi-disciplinary field of study (Halbesleben, 2008a)—all appear to be rooted in the core constructs of COR. Further, the term "resources" is an interesting one. Ubiquitous in the sense that almost everything might be considered a "resource," it is also simultaneously vague in its conveyance of the specific element or elements that can lead to an imbalance with job demands (Anthony, 2012). "Resources" may represent the capital an individual can use to ward off stress, but they also reflect a powerful building block for understanding that which an individual might need in order to engage.

The study of stress among IT professionals across industries is of significant interest to organizational researchers given the increasing dependence upon the development and support of complex technologies in the business community (Ivancevich, Napier, & Wetherbe, 1985). In the few published studies about stress among IT (or information systems) professionals, the findings were consistent with those stressors described by Hobfoll's (1989) lack of resources (Ivancevich et al., 1985; Sheng-Pao, James, Gary, & Eric, 2011). Further, Ivancevich et al.'s (1985) study suggested that IT professionals with "Type A" personalities (a common occurrence) were more susceptible to workplace stress and even more negatively impacted. Focusing on some of the unique job attributes of high-tech jobs, a group of researchers recently developed and tested an instrument based on COR and specifically targeted to measure stress among professionals working in this capacity, the Workplace Stressor Assessment Questionnaire

(Mahmood et al., 2010). In this model, researchers combined elements from widely-published demands-control and efforts-reward imbalance models of stress in order to operationalize the measurement of workplace stress more efficiently and completely for U.S.-based high-tech employees (Mahmood et al., 2010).

The effects of workplace stress continue to attract the attention of scholars, particularly in the healthcare industry (Halbesleben, 2008c). Hospitals are cited among the most stressful of work environments and have been studied extensively, yet a comprehensive understanding of the impact of stress on healthcare professionals is still lacking (Halbesleben, 2008b; "Keeping patients safe: Transforming the work environment of nurses," 2004). There is little doubt, however, that the changing healthcare landscape is increasing the stressful forces at play in the workforces of hospitals (Mathews, 2011; Rae-Dupree, 2009). Conditions in the approximately 5,000 U.S. hospitals currently working to implement EHRs are particularly stressful for the IT professionals supporting that initiative and yet dependent upon the sustained engagement of these employees in order to be successful (Anthony et al., 2014). The potential consequences of poor or unsuccessful EHR implementations are both negative and serious, and industry experts clearly support workforce-related interventions that improve the success of these efforts—both as a strategic imperative and as a patient safety one (M. I. Harrison, Koppel, & Bar-Lev, 2007).

Burnout

Research on the condition of workplace burnout began with the study of professionals working in the human services and healthcare industries and linked

emotional depletion with the loss of motivation and commitment (Freudenberger, 1975, 1986; Maslach, 1976). These initial studies focused on burnout not as a response to stress, but in terms of the transactions and relationships between individuals at work (Maslach et al., 2001). Over time, the definition of burnout evolved to reflect a psychological response to chronic interpersonal stressors at work and to the erosion of employee engagement, but the basic construct remains unchanged (Maslach et al., 2001). There are numerous definitions and related operationalizations of burnout published in the scholarly literature, but the following represents a summary of the three that are most prominent and widely-used.

According to Maslach et al. (1996) "Burnout is a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with people in some capacity" (p. 4). This multi-dimensional definition (Figure 4), one of the most widely accepted, emerged in the early 1980s and remains the conceptual framework that underpins much burnout-related research today (Schaufeli & Buunk, 2002; Schaufeli et al., 1993). As researchers sought empirical validation, a quantitative scale, the Maslach Burnout Inventory (MBI), was developed to measure these three dimensions—a proprietary scale that remains in wide use (Maslach & Jackson, 1981). More recent empirical studies have challenged the validity of these three dimensions suggesting that only exhaustion and cynicism, but not personal efficacy, represent the true elements of burnout (Lee & Ashforth, 1996). Nevertheless, the three-factor MBI scale and its successors, optimized for fields other

than human services, remains one of the most widely used and accepted measures of burnout (Demerouti et al., 2010).

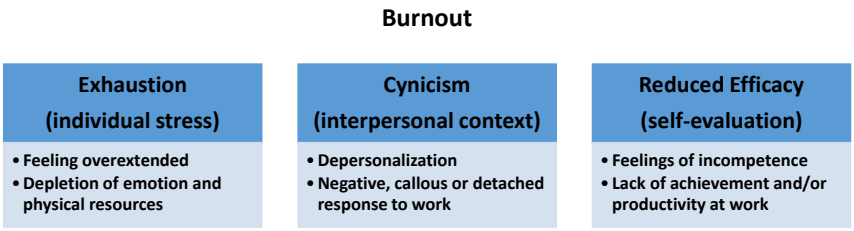


Figure 4. Maslach, Jackson & Leiter (1986) Burnout Model

Despite widespread empirical testing of the MBI as a measure of burnout and the apparent invariance of its findings across occupations and nations, one of the strongest criticisms of the MBI related to the framing of the survey questions (Halbesleben & Demerouti, 2005). Some researchers believed that because all the items in each subscale within the MBI were framed in the same direction (e.g., all the exhaustion and cynicism questions were phrased negatively and all the efficacy questions were phrased positively), the results could be artificially skewed based on the phenomenon of "clustering" (Halbesleben & Demerouti, 2005).

The Oldenburg Burnout Inventory (OLBI) reframed the measurement of burnout around two factors: exhaustion and disengagement from work (Demerouti et al., 2002). Although this operationalization of burnout was similar to Maslach et al. (2001) in that it positioned burnout as the exact opposite of engagement, there are a number of important differences. The OLBI 1) includes both positively and negatively phrased questions; 2) expands the operationalization of exhaustion by including physical and cognitive factors

in addition to emotional factors; 3) expands the operationalization of depersonalization beyond a feeling of being distanced from other people to include distancing from work tasks; 4) adds additional factors to assess disengagement including the relationship between employees and their jobs; and 5) eliminates the personal efficacy factors suggesting that these factors may be negatively correlated as the consequence of burnout, but not as the antecedents (Demerouti et al., 2002).

Another broadly recognized conceptualization of burnout was posited by Pines and Aronson (1988) as "a state of physical, emotional and mental exhaustion caused by long-term involvement in situations that are emotionally demanding" (p. 9). Physical exhaustion is characterized by feelings of being tired, weak or having low energy. Emotional exhaustion involves feeling helpless, hopeless or trapped. Finally, the third dimension, mental exhaustion, reflects the development of negative attitudes such as feeling like a failure (Figure 5) (Pines & Aronson, 1988). A measurement of this exhaustion-based conceptualization, the Burnout Measure (BM) (Pines & Aronson, 1988), is also in wide use—second only to the MBI in terms of frequency (Schaufeli et al., 1993). Recently, a shorter version of the BM was developed in response to researchers' demands for an easier-to-use instrument. This new instrument, the Burnout Measure, Short Version (BMS) includes 10 of the BM's original 21 questions, evidenced strong reliability and validity in testing, and its results were consistent with those of the BM (Malach-Pines, 2005).

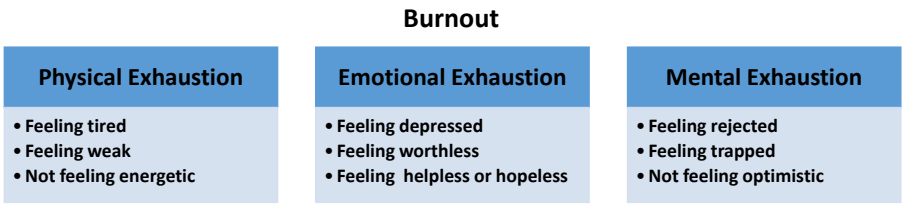


Figure 5. Pines and Aronson (1988) Burnout Model

Like the MBI, the BM has also been challenged (Enzmann, Schaufeli, Janssen, & Rozeman, 1998). Some argue that, despite its intent to operationalize a multi-dimensional conceptualization of burnout, factorial studies suggested that it is one-dimensional which then questions whether it truly operationalizes Pines and Aronson's (1988) conceptual model (Schaufeli et al., 1993). One of the authors of the BM, Malach-Pines (2005), acknowledged the instruments' exhaustion-based uni-dimensionality, but she countered that numerous researchers have shown exhaustion to be the "central, dominant and most significant component of burnout [sic] and its only intrinsic dimension" (p. 79). Whereas some also suggest that the BM is less sensitive to situational differences or context than the MBI or OLBI (Enzmann et al., 1998), all three instruments evidenced high reliabilities and validity in empirical study with thousands of participants in numerous industries and countries. Most importantly, researchers agree that the burnout instruments in broadest use in research and practice, the MBI and the BM, reflect the underlying premise of burnout as resulting from the exhaustion of an individual's resources (Hobfoll, 1989; Schaufeli et al., 1993). Further, emotional exhaustion appears to be the most consistently validated dimension of burnout across all burnout measurement instruments (Schaufeli et al., 1993).

An empirical link between burnout and stress was presented by Gorgievski and Hobfoll (2008) who suggested that burnout was the unavoidable result of the chronic and steady depletion of an individual's resources when that individual is unable to replenish those key resources. More specifically, these researchers went on to suggest that an individual's behavioral response to stress most often begins as fatigue in attempt to retreat internally and conserve those resources necessary to preserve one's internal well-being. Over time however, and in response to prolonged stressors, the compensatory effort required to both hedge against resource loss and work to ensure resource gain reduces the adaptive capabilities of individuals. Exhaustion, depersonalization and feelings of reduced personal accomplishment—all elements of burnout—become evident (Gorgievski & Hobfoll, 2008).

The organizational phenomenon of burnout is still heavily researched and empirical studies have attempted to validate theoretical relationships between burnout and engagement (Demerouti et al., 2002; Maslach et al., 2001; Schaufeli et al., 2002). Burnout has been positioned by a number of scholars as the opposite or antipode of engagement under the premise that those who are engaged could not be burned out at the same time (Maslach et al., 2001; Schaufeli et al., 2002). The measurement of burnout remains largely dominated by the MBI, OLBI and BM instruments and, although studies confirmed the factorial validity of all three, researchers also sought to use the MBI and OLBI instruments to measure engagement with the inverse responses to instruments' questions (Demerouti et al., 2002; Maslach et al., 2001). However, diverging schools of thought remain regarding the nature of this relationship, with some arguing that although

burnout may be the opposite of engagement, it is an entirely separate construct and should not be measured by the reverse scores of a burnout instrument (Bakker et al., 2008; Kahn, 2013; Schaufeli et al., 2002).

Significant research on the condition and consequence of burnout remains focused on the healthcare industry (Halbesleben, 2008c). However, research is still limited on the outcomes of burnout and its relationship to engagement in healthcare settings (Golembiewski, 1999; Halbesleben, 2008c). There is little contention however, about the empirical link between burnout and negative organizational consequences. In particular, burnout, as an adaptation-related breakdown in response to prolonged job stress, was positively correlated to turnover intention, erosion of organizational commitment, and reduced job satisfaction (Kahill, 1988, p. 2; Schaufeli & Bakker, 2004).

Employee Engagement

The concept of employee engagement emerged from the positive psychology movement in which researchers began to focus on understanding the factors that can lead to and sustain positive human behaviors and the related positive consequences of those behaviors (Alderfer, 1972; Kahn, 1990, 1992; Seligman & Csikszentmihalyi, 2001). Theoretically derived from the seminal work of Kahn (1990), employee engagement was recently explained as "an individual employee's cognitive, emotional and behavioral state directed toward desired organizational outcomes" (Shuck & Wollard, 2010, p. 103). Importantly, engaged employees have been empirically linked to better organizational outcomes and competitive advantages in numerous studies across many industries, including healthcare (Shuck, Reio, et al., 2011; Shuck, Rocco, et al., 2011; Small &

Small, 2011). Further, whereas engagement is often posited as a framework within which to understand employee behavior, it is also an outcome that can be tested and operationalized (Kahn, 1990; Shuck et al., 2013; Shuck & Owen, 2013).

A number of scholars have questioned whether employee engagement is, in actuality, a unique construct (D. A. Harrison, Newman, & Roth, 2006). Rather euphemistically described as "old wine in a new bottle," there are also scholars who question the utility of employee engagement in comparison to other job-related constructs like job satisfaction, job involvement and organizational commitment (Newman, Joseph, & Hulin, 2010; Newman, Joseph, Sparkman, & Carpenter, 2011). In recent years however, a number of scholars have conducted empirical comparisons of these constructs and a corpus of evidence is building that supports both the nomological distinction and uniqueness of employee engagement (Christian et al., 2011; Nimon, Shuck, & Zigarmi, 2014; Shuck, Zigarmi, & Nimon, 2014). As recently stated, "… the concept of engagement has its own integrity and uniqueness … [and] it may be time for practitioners to use the concept more widely as a way of understanding the motivation of their workers" (Zigarmi et al., 2014, p. 10).

In the years since Kahn's (1990) groundbreaking research, four distinct frameworks of engagement have been identified (Fletcher & Robinson, 2013; Shuck, 2011; Shuck et al., 2013): 1) a needs-satisfaction framework (Kahn, 1990; May et al., 2004; Rich et al., 2010; Soane et al., 2012); 2) a burnout-antithesis framework (Maslach et al., 2001; Schaufeli et al., 2006; Shirom, 2004); 3) a job satisfaction framework (Harter et al., 2002; Robinson et al., 2004); and 4) a multi-dimensional framework (Saks, 2006).

Each of these materially different frameworks has been operationalized with different instruments, all measuring "engagement." An overview of each framework follows.

Needs-Satisfaction Framework

As first conceptualized by Kahn (1990, 1992), engagement reflected the analogical premise that "the more people draw on their selves to perform their roles …the more stirring are their performances and the more content they are with the fit of the costumes they don" (Kahn, 1990, p. 692). Kahn's (1990, 2010) understanding of engagement, driven by years of qualitative work in numerous fields including healthcare, posited that people are motivated to engage (or express themselves) and disengage (or withdraw themselves) in response to how they see themselves in specific roles and with respect to three psychological pre-conditions: meaningfulness, safety and availability. In the over 20 years since he first presented this model, Kahn (2010) has maintained his focus on this needs-satisfaction framework, resisting more recent attempts to re-conceptualize engagement as somehow related to burnout.

According to Kahn (1992), *meaningfulness* refers to the extent to which an employee feels valued and worthwhile and correlated to: 1) challenging, creative and autonomous task characteristics; 2) role characteristics of shared expectations, status and/or influence; and 3) work interactions with co-workers and clients that are positive and reflect rewarding interactions (Kahn, 1990). His second psychological influence on engagement, *psychological safety*, reflects the extent to which an individual can express his/her preferred self without fear of negative consequences. Factors which support psychological safety include positive, consistent and non-threatening interactions with

co-workers and supervisors and the establishment of shared expectations of organizational norms. The third pre-condition to engagement, *psychological availability*, was defined as "the sense of having the physical, emotional, or psychological resources to personally engage at a particular moment" (Kahn, 1990, p. 714), and is impacted by physical and emotional energies, insecurities, relationships, distractions and outside life interactions. Kahn's (2007b; Kahn & Heaphy, 2013) most recent work stressed the primacy of positive interpersonal relationships at work (a key element of all three psychological pre-conditions) as foundational to the capacity for one to engage.

Other researchers have attempted to operationalize Kahn's (1990) needs-satisfaction concetualization. In 2004, May et al. conducted a study that validated all three of Kahn's psychological pre-conditions of engagement (Kahn, 1990; May et al., 2004). The work of Rich et al. (2010) refined that operationalization and showed that engagement mediated the relationship between certain antecedents such as perceived organizational support and the employee behaviors of task performance and organizational citizenship behaivor. Shuck et al. (2011) used the May Scale (May et al., 2004) to reveal significant relationships between job fit, affective commitment, psychological climate and engagement, and subsequent signficant relationships between engagement and both discretionary effort and turnover intention. Lastly, Soane et al. (2012) expanded the operationalization of the needs-satisfaction framework to include a behavioral (or affective) dimension and a social dimension reflecting their belief that Kahn's (1990, 2007b) conceptualization of engagement was predicated on the presence of positive relationships at work. The results of this study evidenced significant

relationships between engagement and the outcomes of task performance, organizational citizenship behavior and intent to stay (Soane et al., 2012).

Whereas the influence of psychological availability was specifically correlated to stress and burnout (Schaufeli & Buunk, 2002), all three psychological conditions, as described by Kahn (1990), are also similar to those found in Hobfoll's (1989, 2011) COR. As such, they seem remarkably consistent in their representations of those factors that lead to the accumulation of resources which, in turn, may both mitigate stress and promote engagement (Figure 6). For example, Kahn (1990) presented the psychological condition of meaningfulness as one's "return on investment" (p. 705) bringing to mind Hobfoll's (1989) concept of resource investment. In fact, prominent scholars in this field suggest that a re-conceptualization of COR with respect to engagement should be explored (Gorgievski & Hobfoll, 2008). Similarly, the concept that there are "limits on the pool of energy and resources available to employees for [sic] sustained engagement" (Macey & Schneider, 2008, p. 25) has also been proposed.

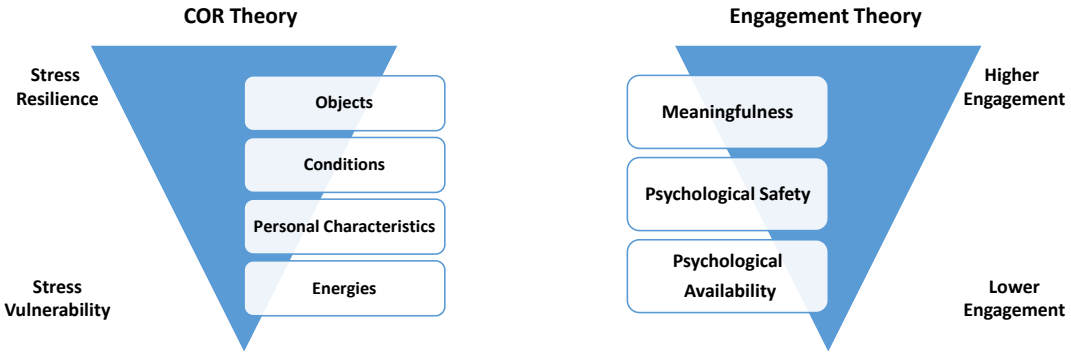


Figure 6. COR (Hobfoll, 1989) vs. Engagement (Kahn, 1990)

Burnout-Antithesis Framework

In a significant evolution of burnout theory, Maslach et al. (2001) asserted that engagement is the opposite of burnout and thus can be measured by the inverse of the MBI scale. This claim reflected the researchers' premise that those who are engaged could not be burned out at the same time (Maslach et al., 2001), and that the stressful conditions leading to employee burnout would also result in an erosion of engagement (Cole et al., 2012). Importantly, it positioned burnout and engagement on "opposite ends of a common continuum" (Cole et al., 2012, p. 1552). Research findings supported this theory with some empirical findings of engagement as measured by negative responses to the antecedents of burnout: unsustainable workloads, limited feelings of choice or control, no recognition or rewards, an unsupportive work community, no sense of fairness or justice, and work that is seen as unvalued or meaningless (Maslach & Leiter, 1997). On the other hand, it is possible that although these negative responses may have measured the opposite of burnout, they did not necessarily measure the presence of engagement.

Focusing specifically on work engagement, Schaufeli et al. (2006) proposed a different conceptualization and related measurement scale, the Utrecht Employee Engagement Scale (UWES), that sought to operationalize the following definition: "work engagement is the positive, fulfilling work-related state of mind that is characterized by vigor, dedication and absorption" (p. 702). *Vigor* was specifically defined as "high levels of energy, mental resilience while working, the willingness to invest in one's work and persistence in the face of difficulties" and thus, the "direct opposite of the core burnout

dimension of exhaustion" (p. 702). Similarly, the authors framed the characteristic of *dedication* in polar opposition to the burnout dimension of cynicism, describing this factor as an experienced sense of "enthusiasm, inspiration pride and challenge" (p. 702). *Absorption*, being engrossed in one's work, was viewed independently as a condition of engagement and thus was not framed in context with burnout dimensions (Schaufeli et al., 2006).

Unlike Maslach et al. (2001) and Demourti et al. (2002), Schaufeli (2006) and his colleagues believed that although burnout and engagement may be opposite concepts, they still represented different constructs that must be measured independently. This belief appeared to lie in 1) the positivist lens within which engagement was framed (as opposed to burnout); 2) the fact that the third dimensions of burnout and engagement, reduced efficiency and absorption respectively, were not perceived to be direct opposites like the other factors; and 3) a desire to operationalize engagement separately from burnout so as to better understand its relationship with burnout (Bakker et al., 2008). As distinct constructs, this perspective presented engagement not on the same continuum as burnout, but rather, as the "positive antipode" of burnout (Schaufeli et al., 2006, p. 702).

Nevertheless, the UWES instrument clearly reflects its burnout-antithesis based framework of engagement as evidenced by the questions in the instrument's vigor and dedication dimensions which are almost the exact opposite of those found in the MBI's exhaustion and cynicism dimensions. Table 1 compares the actual survey questions from the MBI-General Survey (MBI-GS) and UWES scales along the factors of exhaustion vs. vigor and cynicism vs. dedication revealing the bi-polar positioning of each.

Table 1. MBI-GS vs. UWES

MBI-GS Survey Items: Exhaustion	UWES Survey Items: Vigor
EX1. I feel emotionally drained at work.	VI1. At my work, I feel bursting with energy.
EX2. I feel used up at the end of the day.	VI2. At my job, I feel strong and vigorous.
EX3. I feel tired when I get up in the morning and have to face another day on the job.	VI3. When I get up in the morning, I feel like going to work.
EX4. Working all day is really a strain for me.	VI4. I can continue working for very long periods at a time.
EX5. I feel burned out from my work.	VI5. At my job, I am very resilient, mentally.
MBI-GS Survey Items: Cynicism	**UWES Survey Items: Dedication**
CY.1 I have become less interested in my work since I started this job.	DE1. I find the work that I do full of meaning and purpose.
CY2. I have become less enthusiastic about my work.	DE2. I am enthusiastic about my job.
CY3. I just want to do my job and not be bothered.	DE3. My job inspires me.
CY4. I have become more cynical about whether my work contributes to anything.	DE4. I am proud of the work that I do.
CY5. I doubt the significance of my work.	DE5. To me, my job is challenging.

Yet another burnout-antithesis framed engagement measure, the Shirom-Melamed Vigor Measure (SMVM) was developed from a conceptualization of engagement that focused on vigor, "a positive affective response to one's ongoing interactions with significant elements in one's job and work environment" (Shirom, 2004, p. 12). Like Schaufeli et al. (2006), Shirom (2004) viewed engagement as a separate construct from burnout (in fact, he had his own burnout measurement instrument), but the SMVM still reflects engagement as antipodean to burnout (Fletcher & Robinson, 2013).

Interestingly, in examining the measures that position engagement relative to burnout (for example, the MBI, UWES and SMVM), all are dominated by questions about one's affect or emotion (Nimon, 2014). Given that emotional exhaustion appears to be the most consistently validated dimension of burnout across all burnout measurement instruments (Schaufeli et al., 1993), it is not surprising that engagement

measures heavily represented by questions about affect will evidence strong negative relationships with burnout (Shuck et al., 2012).

It is important to note that despite the multiplicity of published research studies in support of the burnout-antithesis framework of engagement, Kahn (2013) did not endorse this view. He fundamentally rejected the premise that engagement and burnout are on the same continuum or opposites of each other, and although he agreed that burnout and engagement are separate constructs, he disagreed with the premise that one cannot be simultaneously burned out and engaged (Kahn, 2013). In fact, he described many examples he witnessed during his field research of healthcare workers who met every theory-based definition of being burned-out, yet had the capacity to engage and regularly engaged completely in the treatment and care of their patients (Kahn, 2013). Shuck (2011), also concerned with this perspective, suggested that an employee may be engaged even though he/she may not be "bursting with energy" (Schaufeli et al., 2006, p. 714). On this, Kahn (2013) reflected that engagement is not, in fact, about the energy an employee exhibits, but rather about the energy an employee dedicates, visibly or not, to the task(s) at hand.

Job Satisfaction Framework

In 2002, Harter, Schmidt and Hayes published a study based upon the survey results collected by the Gallup Organization from almost 8,000 businesses in multiple industries. The analysis of the data from this study resulted in a new definition of engagement: "an individual's involvement and satisfaction with as well as enthusiasm for work" (Harter et al., 2013; Harter et al., 2002, p. 471). These data and the instruments

used to collect them are challenging to validate because they are proprietary to the Gallup Organization. Nevertheless, the Gallup Work Audit (also known as the Q12) is in wide use in U.S. companies, including healthcare organizations, as a proxy for the measurement of both job satisfaction and employee engagement ("Press Ganey," 2011). In fact, The Advisory Board Company, one of the top C-level strategy companies in the healthcare industry, specifically endorsed the use of the Gallup Work Audit for this purpose ("Employee Engagement Initiative," 2013).

Similarly, Robinson, Perryman and Hayday (2004) developed a measure of engagement that also operationalized a job-satisfaction framed definition of engagement. This measure, the Institute for Employment Studies (IES) measure, considers engagement as a positive attitude toward an organization and its values (Robinson et al., 2004). Validated with over 10,000 employees, the IES is typically used as a "diagnostic tool alongside measures of key drivers such as feeling valued and involved, job satisfaction and good quality management" (Fletcher & Robinson, 2013, p. 277).

As part of their meta-analytic review of engagement measurement instruments, Christian et al. (2011) determined that job satisfaction (like burnout) may be related to engagement, but it is not necessarily the same construct nor can it necessarily be measured by an instrument specifically designed to measure job satisfaction (or burnout). This suggests that the widespread adoption of the Gallup Work Audit and IES, with their huge comparative databases, may be indicative of their value as well-understood benchmarks to the business community rather than as actual reflections of the real operationalization of employee engagement (Kahn, 2013).

Multi-Dimensional Framework

The fourth framework for understanding employee engagement identified by Shuck (2011) was first proposed by Saks (2006) and partially affirmed by the conceptual work of Macey and Schneider (2008). Drawing upon the work of many prior scholars including Kahn (1990), Harter et al. (2002) and Maslach et al. (2001), Saks developed a multi-dimensional definition and model of employee engagement that included cognitive, emotional and behavioral components, and he successfully tested this model against a number of antecedent and outcome variables. This model specifically distinguished between job and organizational engagement suggesting that the former was linked to an employee's work-related role, and the latter was more closely tied to an employee's role within an organizational system (Saks, 2006).

According to Shuck (2011), Saks' (2006) viewpoint aligned with that of Schaufeli et al. (2002) in that absorption was the key to the development of engagement and that "in order for absorption to occur, an employee must readily have the physical, emotional and psychological resources to complete their work" (p. 315). Interestingly, Shuck (2011) also pointed out that Rich et al.'s (2010) work, although framed under a needs-satisfaction based conceptual model, also validated Saks' (2006) multi-dimensional perspective by testing and providing empirical support to a behavioral element of engagement.

Arguing that "the relationships among the potential antecedents and consequences of engagement … have not been rigorously conceptualized much less studied," Macey and Schneider (2008, pp. 3-4) offered yet another multi-dimensional framework for

consideration. This framework presented job characteristics (including autonomy, complexity, feedback and work conditions), leadership (including both transformational and interactions between leaders and employees) and personality traits (including conscientiousness, positive outlook and proactiveness) all as antecedents to engagement, and engagement as a proximal factor to job performance. However, this framework has not yet been operationalized.

Positive Interpersonal Relationships at Work

There is little doubt that Kahn's (2005, 2007a, 2007b) conceptualization of engagement is underpinned by the belief, supported by his research, that the presence of positive and trusting interpersonal relationships at work is the common denominator to the opportunity for employees to engage. In fact, he commented specifically that the term "engagement" is a matrimonial analogy—one that presumes trust is at the core of one's ability to be "engaged" to (or with) someone else (Kahn, 2013). Further, his perspective on positive, trusting relationships was not limited to those with organizations and/or their leaders, but extended to co-workers, supervisors and other peers (Kahn & Heaphy, 2013).

Like engagement, the construct of workplace trust does not benefit from universal definition or conceptualization (Kramer, 1999). The construct has been studied since the 1950s with an early definition by Deutsch (1958) who suggested that in exchange for personal vulnerability one would accept a "non-rational expectation" of an outcome. Almost forty years later, one of the most widely accepted integrative models was introduced similarly suggesting that an individual's willingness to both accept personal

vulnerability and maintain positive expectations about others was definitional to workplace trust (Mayer et al., 1995). Interpersonal trust was shown to improve the effectiveness of the coordinated efforts of interdependent employees and was also linked to numerous positive organizational outcomes (McAllister, 1995), and recent studies that operationalized this model also established that there are different targets of trust, namely an employee's trust in his/her co-workers, supervisor and organization (Ferres, 2002; Ferres, Connell, & Travaglione, 2004; M. D. Spector & Jones, 2004; Tan & Tan, 2000). This theoretical conceptualization is consistent with the perspectives of those who view workplace trust as foundational to psychological safety and thereby key to engagement (Kahn, 1990, 2007b; Macey & Schneider, 2008).

Kahn (1990) defined psychological safety, the most important of his pre-conditions to engagement, as the ability "to show and employ one's self without fear of negative consequences to self-image, status, or career" (p. 708). In his study, he reported that people felt safe in "situations in which they trusted that they would not suffer for their personal engagement" (p. 708) and that work-oriented environments needed to be "predictable, consistent, clear, and nonthreatening" (p. 708) in order to promote trust and create the conditions of psychological safety. The research of both May et al. (2004) and Edmondson (1999) found that co-worker and supervisor relations were positively related to psychological safety and that positive relationships could create a climate of psychological safety for individuals and for teams. As an example, Edmondson (1999) explained that the presence of mutual trusting interpersonal relationships means that team

members will be confident to speak up without fear that the team will embarrass, reject or otherwise punish them.

Similarly, another one of Kahn's (1990) psychological pre-conditions, meaningfulness, was specifically tied to the presence of positive and rewarding interactions with coworkers. "We suggest here that a significant component of people's experiences of meaningfulness derives from the relationships that they create in the context of their work" (Kahn & Heaphy, 2013, p. 83). In other words, positive relationships at work are a key antecedent to the ability for an employee to find his/her work meaningful. Finally, psychological availability, Kahn's (1990) third psychological precondition, is predicated on the availability of those "resources" which are conducive to an individual's inclination to engage. Clearly, positive relationships at work which have the "potential to provide or deplete [people] of positive energy" (Kahn & Heaphy, 2013, p. 88) represent such resources.

If the presence (or absence) of positive, trusting interpersonal relationships at work is key to employee engagement, it follows that the measurement of engagement should include a dimension of social context or connectedness with other people at work (Shuck & Wollard, 2010; Soane et al., 2012). One engagement measurement instrument, ISA Scale (Soane et al., 2012), includes such a dimension and may, therefore, be more sensitive to the presence of positive interpersonal relationships at work than other engagement measures. This means employee engagement as measured by the ISA instrument may be more resilient in the face of workplace stress and/or burnout. If true, this also suggests that the development of a positive and supportive culture that fosters

trusting interpersonal relationships at work may be one of the most influential factors in creating workplace environments conducive to employee engagement (Kahn, 2013).

Differences in the Measurement of Employee Engagement

One of the challenges to the study of employee engagement is its operationalization, and there remains spirited disagreement as to both its nomological framework and the mechanisms by which engagement is measured (Christian et al., 2011; Fletcher & Robinson, 2013; Halbesleben, 2008b; Shuck et al., 2012; Shuck et al., 2013; Viljevac et al., 2012). In recent years, a number of researchers have attempted to refine and/or develop measurement scales in the hopes of both validating the construct and developing interventions that can aid organizations in achieving improved outcomes (Table 2). As previously discussed, however, the different measurement scales reflect subtle differences in the conceptualization of engagement in some cases, and, in other cases, significant differences in their underlying nomological frameworks.

Table 2. Engagement Conceptualizations and Measurement Scales

Needs-Satisfaction		**Burnout-Antithesis**	
Framework	**Measurement**	**Framework**	**Measurement**
• Kahn (1990, 1992) • May, Gilson & Harter (2004) • Rich, LePine & Crawford (2010) • Soane, Truss, Alfes, Shantz, Rees, Gatenby (2012)	• None • May Psychological Engagement Scale • Rich Employee engagement Scale • ISA Engagement Scale	• Maslach, Jackson & Lieter (1996) • Demerouti, Bakker, Vardakou & Kantas (2002) • Schaufeli, Bakker, & Salanova (2002) • Shirom (2004)	• MBI • OLBI • UWES • SMVM
Job Satisfaction		**Multi-Dimensional**	
Framework	**Measurement**	**Framework**	**Measurement**
• Harter, Schmidt & Hayes (2002) • Robinson, Perryman and Hayday (2004)	• The Gallup Work Audit (Q12) • IES	• Saks (2006) • Macey and Schneider (2008)	• Saks Employee Engagement Scale • None

Some of the most prolific researchers and publishers in the field of burnout position engagement as the antithesis (or antipode) of burnout, and their measurement instruments suggest that, since burnout is the same thing as disengagement, then the opposite must be true as well (Demerouti et al., 2002; Maslach et al., 1996). Whereas Schaufeli et al. (2006) offered their own definition of engagement, they still viewed engagement as the positive antipode of burnout and used two complimentary measurement scales (the UWES and the MBI) to test their hypotheses (Schaufeli et al., 2006; Schaufeli et al., 2002).

Alternatively, other researchers have focused on trying to understand engagement in its own right—not in relation to burnout—but as an independent construct (Harter et al., 2002; Macey & Schneider, 2008; May et al., 2004; Rich et al., 2010; Robinson et al., 2004; Saks, 2006; Soane et al., 2012). With the exception of the proprietary Gallup Work Audit instrument and IES, the other engagement measurement scales are all more similar in that they are better aligned with Kahn's (1990) original conception, but they are also substantially more limited in their empirical applications (May et al., 2004; Rich et al., 2010; Saks, 2006; Soane et al., 2012). Shuck (2011) suggested that the most appropriate framework for conceptualizing and measuring engagement may be the one that best ties to the specific research question under investigation. However, this variability may serve to further confound our collective understanding of engagement, its operationalization and the potential interventions that can influence it in practice.

Nevertheless, in practice, the measurement of employee engagement remains largely dominated by the burnout-antithesis based UWES (Schaufeli et al., 2006) and the

job satisfaction based Gallup Work Audit (Harter et al., 2002). Suggesting that empirical links between burnout and engagement may represent construct proliferation rather than opposing (and thus, redundant) constructs, researchers completed a meta-analytic review of empirical findings from the MBI and UWES (Cole et al., 2012). Their analysis revealed that these scales measured substantially similar factors meaning that the UWES was not necessarily effective at measuring engagement as a distinct phenomenon from burnout. Further, they concluded that the UWES may measure the antipode of burnout, but not necessarily the construct of engagement (Cole et al., 2012). In another meta-analytic study by Christian et al. (2011), investing one's whole self (as opposed to job satisfaction) seemed to correlate directly with engagement despite Harter et al.'s (2013; 2002) studies that linked the concept of job satisfaction to engagement. In other words, the two instruments that are most widely used in the business and scholarly communities to measure engagement may, in fact, be measuring something else.

Considered a different way, there are six (non-commercial) engagement measures published in the scholarly literature: The UWES (Schaufeli et al., 2006), the SMVM (Shirom, 2004), the May Scale (May et al., 2004), the Rich Scale (Rich et al., 2010), the Saks Scale (Saks, 2006) and the ISA Scale (Soane et al., 2012). With the exception of the UWES and the SMVM which position engagement as the antipode to burnout, the others are all generally based upon Kahn's needs-satisfaction framework. A recent study compared the validity of the burnout-antithesis based UWES and the needs-satisfaction based May Scale and suggested that the two measures may be measuring overlapping constructs, but they are not measuring identical ones (Viljevac et al., 2012). Yet, even

the four measures which were based on a needs-satisfaction framework are different enough as to question the understanding of what they were trying to operationalize. As a consequence, it is likely that even these measures of engagement will reveal different relationships with key phenomena such as workplace stress and burnout.

COR theory is widely thought to explain the eventual condition of burnout, but there may be a more direct relationship between the availability and accumulation of resources and engagement. Gorgievski and Hobfoll (2008) suggested that employee engagement is multi-dimensional and persisted when the conditions of "dynamic stability and tolerance for failure" (p. 19) were supported. These conditions, premised under a framework of creativity and innovativeness, are enabled through positive interpersonal relationship factors such as trust, interdependence and loyalty and organizational factors such as flexibility and balance. More importantly, it appears that they are <u>not</u> the same factors that explain the opposite of burnout.

Kahn's (1990, 1992, 2010) conceptualization of engagement implied a depth of consideration (i.e., the simultaneous investment of energies and the investment of one's whole self) that seems thinly served by positioning it as related to burnout or by measuring it through the lens of job satisfaction. Given the disagreement among scholars on this perspective, there is increasing interest in operationalizing Kahn's (1990) conceptualization of engagement (Fletcher & Robinson, 2013; Shuck, 2011; Shuck et al., 2012). However, even different needs-satisfaction based measures may reveal important differences in their relationships with certain variables. If, as suggested, the presence of positive, trusting interpersonal relationships (clearly a valued resource as defined by

COR) is foundational to understanding the circumstances under which an individual will engage, then engagement measurement instruments, such as Soane et al.'s (2012) ISA Scale, that include a social or interpersonal dimension may reveal very different relationships with workplace stress and/or burnout than other instruments.

Change in the U.S. Healthcare Industry

Transformative change is underway in the approximately 5,000 community hospitals in the United States and this change is having a major impact on hospitals and their workforces (Mathews, 2011). The industry is in the midst of a fundamental shift toward healthcare delivery systems that will focus on preventive and chronic care as opposed to episodic care, yet hospitals remain mired in past practices of high-cost, centralized business models optimized for volume: treating acute illnesses, managing infectious diseases and responding to trauma (Gostin, 2012; Rae-Dupree, 2009).

The Affordable Care Act introduced even more uncertainty and most industry experts agree that U.S. hospitals will require significant change to survive and compete in a climate that will demand increased transparency, greater accountability for outcomes, pressure for collaborative ventures that support programs for population health management, shifts in delivery models from inpatient/acute services to outpatient/preventive services, and financial stability in spite of shrinking payments for healthcare services ("Affordable Care Act," 2010; Mathews, 2011). In particular, one such initiative, the federal requirement to implement and "meaningfully use" electronic health records (EHR) in hospital settings by 2015, is having a dramatic impact on the workforces of hospitals as its success requires employees to work under significant stress

while simultaneously remaining engaged in the provision of services (Brooks & Grotz, 2010).

The use of electronic health records in hospitals fundamentally alters the ways in which clinicians work and, with this change, comes the potential for error (Blumenthal, 2009; Blumenthal & Tavenner, 2010; M. I. Harrison et al., 2007; Hennington et al., 2011; Jha, 2011). Although empirical evidence of patient safety risks and negative outcomes associated with EHRs is still limited, anecdotal and intuitive concerns relate to the risks associated with 1) the implementation of complex and disruptive technologies; 2) social-technical interaction changes that can lead to inadvertent error by end-users; and, 3) implementation rates at a breakneck pace as hospitals seek to complete these efforts prior to 2015 in order to maximize federal incentive payments as an offset to the significant capital outlays required for this technology (DesRoches et al., 2010; M. I. Harrison et al., 2007; Terry, 2012).

Recently, the American Medical Association issued the following commentary: "The use of electronic health records has the potential to improve patient safety and early research shows some promise, but these systems have also been linked to errors and harm" (as cited in Wynia & Classen, 2011, p. 2505). In November 2011, the Institute of Medicine, whose landmark study in 1999 (Kohn, Corrigan, & Donaldson) launched the patient safety movement that ultimately led to the federal requirement for the adoption of EHRs, is now seeking to "protect Americans from potential medical errors associated with the use of information technology in inpatient care through both public and private oversight initiatives" (IOM, 2011, p. 7). Another study suggested that while technical

flaws with EHRs contributed to some negative consequences, the changing social-technical interactions (that is, the interplay between EHRs and clinicians in terms of culture, workflow and social interaction) was equally, if not more, responsible for undesirable outcomes (M. I. Harrison et al., 2007).

The risks are real. In some documented cases, the EHRs simply failed to perform as designed. These systems manage millions of data points, many of which interact with one another to drive complex clinical workflows, rules and alerts and, arguably, the interactions are so complex and numerous that it is virtually impossible to test every permutation. Another factor is that these systems are relatively new, having only recently been engineered to function in the resource-limited world of community hospitals. With the added pressure to implement quickly in order to capitalize on federal incentive funds, the potential for the perfect storm becomes more probable than not. A CIO at a large teaching hospital on the East coast relayed a troubling story at a recent conference for healthcare IT executives. She described a significant medication error that occurred over a two year period. An EHR system inadvertently changed the attributes of a particular medication that was prescribed to patients as they were discharged from the hospital. The altered medication orders were submitted electronically to pharmacies for dispensing to over 2,000 patients. Although no one was harmed as a result of the error, the hospital was horrified and the IT professionals responsible for implementing and testing the EHR were devastated.

Although still a new phenomenon, there is emerging research on impact of stress associated with the implementation of EHRs (Gagnon et al., 2009; Scott et al., 2005).

However, these studies have focused almost exclusively on practicing clinicians and the challenges they face in learning new workflows and adjusting their decades-honed practices of care delivery (Hennington et al., 2011). Searches of major academic databases and industry publications evidenced little empirical study of the impact of EHRs on the stress and/or burnout levels on non-clinical professionals and, in particular, the IT professionals who are challenging with implementing and supporting this technology-oriented initiative.

Anecdotally, it is widely reported among healthcare IT leaders that the changing roles of IT professionals, which puts them closer to the patient care process, and the changing environment within which they work is introducing a degree of stress among these professionals unlike any before seen (Cotter, 2012). This is because in most hospitals, clinicians have neither the experience nor expertise to fully engage these systems in such a way as to mitigate their potential risks. As a result, IT professionals find themselves increasingly responsible for both the veracity of the technology that underpins the EHR and support to clinicians during the patient care process (Anthony, 2012).

A consequence of prolonged stress among IT employees may be the exhaustion associated with the condition of burnout (Gorgievski & Hobfoll, 2008), and the subsequent negative impact to employee engagement (Maslach et al., 2001). However, stress may also impact employee engagement long before the stressful conditions lead to burnout. To the degree that IT employee engagement at work is negatively impacted

workplace stress, the risk of EHR failure increases and the negative consequences of such failure potentially increase as well.

Additionally, unlike the large academic medical centers that led the adoption of EHR's a few years ago, community hospitals do not have access to the depth of resources (including residents, informaticists and researchers) who traditionally shouldered some of the burden of EHR implementation and support (Jha, DesRoches, Kralovec, & Joshi, 2010). In most community hospitals, EHR implementation and adoption support is borne almost entirely by IT professionals and predictably, the scarcity of IT resources is increasing as more and more hospitals prepare to implement EHRs (Young, 2010).

The healthcare industry and the hospital environment, in particular, is cited among the most stressful of work environments and has been studied extensively, yet a comprehensive understanding of the impact of stress on healthcare professionals is still lacking (Halbesleben, 2008b; "Keeping patients safe: Transforming the work environment of nurses," 2004). Similarly, research on the condition of burnout within the context of the healthcare industry has received much attention; however, the research is still limited on the outcomes of burnout and its relationship to engagement in healthcare settings (Golembiewski, 1999; Halbesleben, 2008c). Further, there appears to be little study of the direct relationship between stress (independently of the construct of burnout) and engagement (Alarcon & Edwards, 2011).

Conditions in the approximately 5,000 U.S. community hospitals currently working to implement EHRs are both stressful for the IT professionals supporting these initiatives and yet dependent upon the sustained engagement by these employees in order

to be successful. The potential consequences of poor or unsuccessful EHR implementations are both negative and serious, and industry experts clearly support workforce-related interventions that improve the success of these efforts—both as a strategic imperative and as a patient safety one (M. I. Harrison et al., 2007).

Summary of the Chapter

The research hypotheses suggest that the relationships between workplace stress, burnout and employee engagement depend on how the construct of employee engagement is measured. Even similarly conceptualized measures of employee engagement may expose different relationships with these variables suggesting that the selection of employee engagement measurement instruments is vital both to understanding different aspects of the construct and to the operationalization of engagement in practice.

This study's conceptualization of employee engagement is grounded purely in Kahn's theoretical framework and, as such, one of the key premises of the research study is that burnout is not on the same continuum as engagement. There appears to be little doubt that burnout may affect engagement, but to suggest that the two constructs are either opposites, antipodean, or can be measured by an instrument designed to measure burnout appears to be inconsistent with Kahn's original conceptualization of engagement and a somewhat simplistic characterization of its rather complex framework.

Kahn's (1990) engagement conceptualization considers physiological availability as one of his three pre-conditions required for engagement, and availability is analogous to conservation of resources theory's concept of resource accumulation (Hobfoll, 1989).

Those factors that deplete resources and lead to stress also serve to decrease psychological availability and therefore negatively impact engagement. However, Kahn (1990, 2007b) also asserts that psychological safety is the most important psychological pre-condition, and safety is grounded in the presence of positive and trusting interpersonal relationships at work. If the presence (or absence) of these interpersonal relationships at work is key to employee engagement, an engagement measure that includes a social connectedness or interpersonal relationship dimension will likely be more sensitive to the presence (or absence) of these relationships (Shuck & Wollard, 2010; Soane et al., 2012).

It would be consistent with the literature on engagement and COR to suggest that the presence of positive relationships at work may also serve to mitigate the negative impact of stress on employee engagement. The findings from this study, while designed to examine differences in the relationships between certain variables and different operationalizations of employee engagement, also examined the theory that positive, interpersonal relationships at work (a key element of trust) lessen the negative effects of workplace stress on engagement. This is consistent with COR in that positive relationships are clearly "resources" which work to offset the effects of stress (Hobfoll, 1989). It would also lend credence to Kahn's (2013) contention that the most important engagement-related initiative an organization can undertake might be one in which leaders are trained on how to create and foster environments conducive to the development of positive relationships at work.

Therefore, the context for the study was the stress-charged environment of IT professionals working on EHR implementations in U.S. community hospitals. In response to scholars' increasing interest in measuring Kahn's conceptualization (Fletcher & Robinson, 2013; Shuck, 2011; Shuck et al., 2012), burnout-antithesis based engagement measures (that is, the MBI, OLBI, SMVM and UWES) were not used in this study. Similarly, the job satisfaction based measures of engagement (that is, the Q12 and IES) were not used in this study as they are also inconsistent with Kahn's (1990) conceptualization. Saks' (2006) multi-dimensional framework was intended to explore the differences in job engagement and organizational engagement. As this distinction is not relevant to this study, this operationalization was also excluded. Of the three needs-satisfaction based measures of employee engagement published in the scholarly literature, two revealed better reliability and the potential for broad applicability (Shuck et al., 2013): the Rich Scale (Rich et al., 2010) and the ISA Scale (Soane et al., 2012). Importantly though, they are not the same.

The study employed two different needs-satisfaction based measures of employee engagement (the Rich Scale and the ISA Scale) and compared the relationships each operationalization has with workplace stress and burnout by examining the dimensional components of each measure. Ultimately, the study was aimed at addressing the identified gaps in the literature by clarifying the construct of employee engagement in a healthcare context through the exploration of these different operationalizations.

Chapter 3 – Methodology

Introduction

This chapter outlines the design for this study. The following sections are included: the purpose of the study, the research hypotheses, an overview of a pilot conducted in 2013 which pre-tested the hypothesized relationships in this study and influenced the choice of employee engagement measurement instruments for this study, a description of both the population and sample, details about the instrumentation and measurement of responses, a discussion of the methods used to ensure both reliability and validity, data collection procedures, and the analysis of the data. The chapter concludes with a summary.

Purpose of the Study

The purpose of this study was to examine the relationships between workplace stress, burnout and employee engagement using two different engagement measurement instruments and to examine these relationships at the overall (i.e., all dimensions or subscales) and dimensional level of each engagement instrument. Responding to a resurgence in scholarly interest in Kahn's (1990) conceptualization, two different needs-satisfaction based measurements of employee engagement were employed. The relationship each operationalization has with workplace stress and burnout was examined among IT professionals working on EHR implementations in U.S.-based community hospitals.

This study suggests that the relationships between workplace stress, burnout and employee engagement depend on how the construct of employee engagement is measured. Further, even similarly conceptualized measures of employee engagement may expose different relationships with these variables suggesting that the selection of employee engagement measurement instruments is vital both to understanding different aspects of the construct and to its operationalization in practice. Therefore, the study examined each of the dimensional components from the two needs-satisfaction based engagement scales because if, as Kahn (1990, 2007b) suggests, the presence (or absence) of positive, trusting interpersonal relationships at work is key to employee engagement, an engagement measure that includes a social or connectedness dimension will likely be more sensitive to the presence (or absence) of these relationships (Shuck & Wollard, 2010; Soane et al., 2012). Ultimately, the study was aimed at addressing the identified gaps in the literature by clarifying the construct of employee engagement in a healthcare context through the exploration of these different operationalizations.

Research Hypotheses

The study aimed to evaluate measures of engagement that closely reflect Kahn's (1990) conceptualization and, therefore, employed a needs-satisfaction based operationalization of the construct. Specifically, this study represented a side-by-side comparison of two needs-satisfaction based measures: the Rich Scale and ISA Scale. Although both scales were developed based on Kahn's (1990) conceptualization, they are, as previously described, inherently different. Given these differences, it is logical to expect differences in the relationships these two operationalizations have with the studied

independent variables of workplace stress and burnout. Further, by not using a burnout-antithesis based measure of engagement, this study sought to address some of the tensions in the scholarly literature about the relationships between burnout and employee engagement.

There were three key predictions in this study: 1) that two similarly conceptualized measures of employee engagement would evidence different relationships with workplace stress and burnout; 2) that the differences in these relationships would be revealed through an examination of each engagement measure's nomological framework (or subscales); and, 3) that the presence of social engagement improves engagement's resiliency against certain negative forces (or against the resource loss associated with these forces) working against it (Hobfoll, 1989; Kahn, 1990, 1992, 2013). The specific hypotheses are as follows:

Hypothesis 1 predicted a negative relationship between workplace stress and both measures of employee engagement (Figure 7). This hypothesis is grounded in the intersection of Hobfoll's (1989) conservation of resources (COR) theory of stress and Kahn's (1990) theoretical conceptualization of personal engagement. The core premise of COR is that stress results when valued "resources" are lost or under threat of loss. Similarly, Kahn's contends that psychological availability, one of his three psychological pre-conditions of engagement, is only possible when an individual has her/her valued "resources". It follows then that the forces which consume (or threaten) resources both lead to stress and decrease the likelihood of employee engagement. Given that the

measures of employee engagement are based on Kahn's (1990) conceptualization, both should evidence negative relationships with workplace stress.

H_{1a}: *Workplace stress is negatively related to employee engagement as measured by the Rich Scale.*

H_{1b}: *Workplace stress is negatively related to employee engagement as measured by the ISA Scale.*

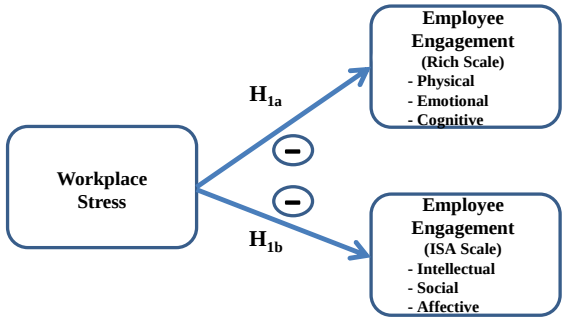


Figure 7. Conceptual Model of Hypothesized Relationships between Workplace Stress and Employee Engagement

Hypothesis 2 predicted that the relationship between workplace stress and employee engagement differs depending upon the instrument used to measure employee engagement. Specifically, this hypothesis asserts that the inclusion of the social (or interpersonal relationship) component in the ISA Scale weakens the negative relationship between workplace stress and employee engagement in comparison to the same relationship measured by the Rich Scale which excludes that dimension. This hypothesis is grounded in Kahn's (2013) contention that positive, trusting interpersonal relationships are both foundational to engagement and improve the resiliency of engagement in the face of resource demands such as workplace stress.

H_2: *The negative relationship between workplace stress and employee engagement is stronger when employee engagement is measured by the Rich Scale than when measured by the ISA Scale.*

The next two hypotheses, H_{3a} and H_{3b}, proposed that the presence of burnout has a mediating or indirect effect on the relationship between workplace stress and employee engagement, and that the indirect effect differs depending upon the instrument used to measure employee engagement (Figure 8). Although Kahn (2013) may not have considered engagement as the opposite of or on a continuum with burnout, research suggests that the two constructs may affect each other (Bakker et al., 2008). This is consistent with the theoretical underpinnings of workplace stress, burnout and engagement. For example, if workplace stressors deplete valued resources which are necessary for the capacity for one to engage, and the accumulation of stressors over time can lead to burnout, it is reasonable to predict that the eventual condition of burnout might explain the negative relationship between stress and engagement.

Hypothesis H_{3b} predicted that the inclusion of the social (or interpersonal relationship) component in the ISA Scale weakens the indirect effect of burnout on the negative relationship between workplace stress and employee engagement in comparison to the same relationship measured by the Rich Scale which excludes that dimension. This hypothesis is supported by Kahn's (2013) contention that positive interpersonal relationships improve the resiliency of engagement in relation to those variables that may otherwise seek to negatively affect it.

H_{3a}: *Burnout fully mediates the negative relationship between workplace stress and employee engagement as measured by the Rich Scale.*

H_{3b}: *Burnout partially mediates the negative relationship between workplace stress and employee engagement as measured by the ISA Scale.*

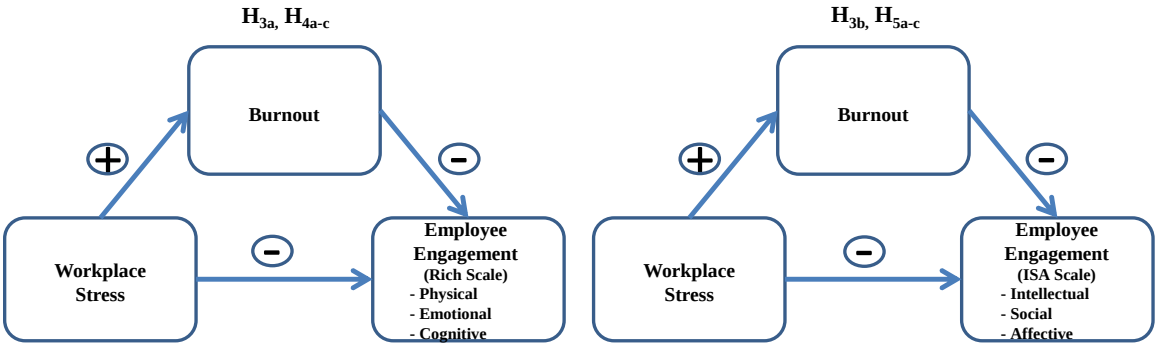


Figure 8. Conceptual Model of Hypothesized Relationships between Workplace Stress, Burnout and Different Measures of Employee Engagement

The final set of hypotheses, H_{4a}-H_{4c} and H_{5a}-H_{5c}, predicted that the differences in the relationships between workplace stress, burnout and employee engagement can be found at the sub-scale or dimensional level of the employee engagement operationalizations and related measurement instruments.

H_{4a}: *Burnout fully mediates the negative relationship between workplace stress and physical employee engagement as measured by the Rich subscale.*

H_{4b}: *Burnout fully mediates the negative relationship between workplace stress and emotional employee engagement as measured by the Rich subscale.*

H_{4c}: *Burnout fully mediates the negative relationship between workplace stress and cognitive employee engagement as measured by the Rich subscale.*

H_{5a}: *Burnout fully mediates the negative relationship between workplace stress and intellectual employee engagement as measured by the ISA subscale.*

H_{5b}: *Burnout partially mediates the negative relationship between workplace stress and social employee engagement as measured by the ISA subscale.*

H_{5c}: *Burnout fully mediates the negative relationship between workplace stress and affective employee engagement as measured by the ISA subscale.*

Overview and Influence of the Pilot Study on This Study

The main purpose of a pilot study is generally to test logistics and gather information prior to a larger study in order to improve the latter's quality and efficiency. A pilot study can reveal deficiencies in the proposed design and/or procedures which can then be addressed before time and resources are expended on large scale studies (Bryman & Bell, 2011). Therefore, a pilot study was conducted in 2013 and sought to examine the relationships hypothesized in this study. The pilot study aimed to test the contention that the application of different employee engagement measurement at the overall (i.e., all dimensions) and at the dimensional level influences the strength of the relationships between employee engagement and the independent variables of workplace stress and burnout.

Sample

The pilot used a relatively small sample size and was aimed at testing the research hypotheses in a healthcare-related company. The results of the pilot were expected to provide some preliminary evidence of the plausibility of the hypothesized relationships.

Respondents were recruited for voluntary participation from the employee population of a small insurance-related company.

A link to the web-based survey was distributed via email to all 105 employees with a request for voluntary participation and a guarantee of complete confidentiality. Sixty-seven employees or 64% completed the survey instrument. Of the actual respondents, 63 (94%) were female and 4 (6%) were male, the average age was 48 (SD=9.9), and the average organizational tenure was 10 years (SD=7.3). Fifteen (22%) of the respondents graduated from high school, 26 (39%) attended college, 23 (34%) had a college degree, and the remaining 3 (5%) started or completed a graduate degree. Fifty-one (76%) of the respondents indicated that they worked directly with clients in some capacity whereas the other 16 (24%) did not, and 17 (26%) of the total respondents worked in some supervisory or managerial capacity.

Measurement Instruments

The survey contained questions consisting of two types: 1) opinion questions ranked on Likert scales ranging from "Strongly Disagree" to "Strongly Agree" and 2) general demographic and job characteristic questions answered via multiple choice options. A few opinion questions were scored on the reverse scale and no free text responses were collected. Further, in an effort to reduce the potential for bias due to common method variance, the questions relating to dependent variable of employee engagement were asked first so as not to lead the respondents. The opinion questions in the survey instrument were derived from the following published and empirically validated instruments:

- Workplace Stress – The recently developed Workplace Stressors Assessment Questionnaire (α=.95) was utilized to assess self-reported perceptions of workplace stress (Mahmood et al., 2010). All 22 items in this instrument were used and responses were scored on a 5 point Likert scale.
- Burnout – The eight questions from the exhaustion dimension of the Oldenburg Burnout Inventory (OLBI) (α=.85) were used (Demerouti et al., 2002; Halbesleben & Demerouti, 2005). Responses were scored on a 4 point Likert scale.
- Employee Engagement – Two needs-satisfaction based operationalizations of employee engagement were used in the pilot. The ISA Scale (α=.91) measured employee engagement with nine questions, reflecting three subscales or dimensions (intellectual, social and affective) (Soane et al., 2012). Responses were scored on a 7 point Likert scale. The May Scale (May et al., 2004) was used as the second needs-satisfaction based operationalization of employee engagement. This particular scale was chosen for the pilot because 1) it represented the first effort to operationalize Kahn's (1990) conceptualization of engagement and 2) results from the May et al. (2004) study were frequently cited (Shuck et al., 2013). All 13 questions from the instrument's three dimensions (cognitive, emotional and physical) were used, and responses were scored on a 5 point Likert scale. Given the use of this scale, the hypotheses in the pilot study (H_{1a}, H_2, H_{3a} and H_{4a-c}) reflected the May Scale instead of the Rich Scale.

- Control Variables – Demographic control variables included gender, age, tenure, and education. Variables related to job characteristics included client interaction and supervisory status. Of note, all of these control variables were included in the hierarchical regression equations between the independent variables and the dependent variables but evidenced no significant effect.

Data Analysis Procedures

Collected data were reviewed for completeness, validated and recoded for consistency prior to statistical testing. Further, the following assumptions were checked prior to performing the analyses: reliability of the scales and subscales, linearity of the relationships between the independent and dependent variables, absence of multicollinearity, homoscedasticity, normality of the dependent variables, and independence of the independent variables (J. Cohen et al., 2003).

Following similar studies (Alarcon & Edwards, 2011) and in accordance with recommended techniques (Tabachnick & Fidell, 2007), multiple hierarchical regression was used to test the hypothesized relationships between the workplace stress, burnout and employee engagement variables using SPSS (version 22). The presence of multicollinearity was also tested (Burnette & Williams, 2005; Kraha, Turner, Nimon, Zientek, & Henson, 2012; Nimon & Oswald, in press), and the tests for mediation were conducted in accordance with the recommended procedures of Baron and Kenny (1996) and confirmed with the Sobel test (Kristopher J. Preacher & Leonardelli).

Results

Table 3 and Table 4 present the descriptive statistics and zero-order correlation coefficients for the independent variables of workplace stress and burnout and the various outcome variables related to employee engagement as measured by the May Scale and the ISA Scale from the data collected in the pilot study.

Table 3. Pilot: Descriptive Statistics, Reliabilities and Zero-Order Correlation Coefficients with May Scale (n=67)

	M	*SD*	*1*	*2*	*3*	*4*	*5*	*6*
1. Workplace Stress	2.47	.62	.92					
2. Burnout	2.33	.39	.62**	.79				
3. Cognitive Engagement	3.19	.60	-.22	-.23	.53			
4. Emotional Engagement	3.83	.61	-.33**	-.28*	27*	.50		
5. Physical Engagement	3.48	.60	.07	.09	.21	.48**	.57	
6. Overall May Engagement	3.50	.45	-.19	-.17	.63**	.77**	.80**	.70

Note: Cronbach's alphas (α) are presented diagonally.
*p<.05 **p<.01

Table 4. Pilot: Descriptive Statistics, Reliabilities and Zero-Order Correlation Coefficients with ISA Scale (n=67)

	M	*SD*	*1*	*2*	*3*	*4*	*5*	*6*
1. Workplace Stress	2.47	.62	.92					
2. Burnout	2.33	.39	.62*	.79				
3. Intellectual Engagement	6.12	1.19	-.18*	-.10	.98			
4. Social Engagement	5.09	1.54	-.36*	-.19	.46*	.96		
5 Affective Engagement	5.49	1.28	-.47*	-.49*	.58*	.53*	.93	
6. Overall ISA Engagement	5.57	1.11	-.41*	-.31*	.80*	.84*	.84*	.92

Note: Cronbach's alphas (α) are presented diagonally.
*p<.01

The basic reliability of each measurement instrument was estimated by both Cronbach's alpha (α) coefficients and zero-order correlation coefficients. Tables 3 and 4 show a range of Cronbach's alphas from .50 to .98. The May Scale, in particular,

evidenced reliability challenges as the dimensional alphas were well below the recommended threshold of .70 (J. Cohen et al., 2003). The Cronbach's alphas from the other instruments suggested sufficiently reliable internal consistencies of the observed items in each instrument (J. Cohen et al., 2003). The inter-correlations among the constructs were acceptable, with the exception of the expectedly high correlations between both measures of overall employee engagement and each of their subscales. The bivariate correlations between workplace stress and burnout were also relatively high at .62, but this is consistent with the literature which suggests that stress and burnout are highly interrelated (Gorgievski & Hobfoll, 2008).

The first hypotheses (H_{1a} and H_{1b}) were designed to test the presence of a negative relationship between workplace stress and employee engagement, as measured by both the May Scale and the ISA Scale. This hypothesis was fully supported for employee engagement as measured by the ISA Scale (β=-.409, p=.001). However, the results were not significant for employee engagement as measured by the May Scale (β=-.192, p=.12). As the result, the second hypothesis (H_2) which proposed that the relationship between workplace stress and employee engagement was stronger when engagement was measured by the May Scale than when measured by the ISA Scale was not supported. Table 5 and Table 6 summarize the results of this regression analysis at the overall and dimensional levels.

Table 5. Pilot: Summary of Regression Analysis for Workplace Stress as a Predictor of Employee Engagement (n=67)

	----- Engagement (May Scale) -----			----- Engagement (ISA Scale) -----		
	B	***SE B***	***β***	***B***	***SE B***	***β***
Workplace Stress	-.137	.087	-.192*	-.726	.201	-.409**
R^2		.037			.168	

* p>.05 **p=.001

Table 6. Pilot: Summary of Regression Analysis for Workplace Stress as a Predictor of Employee Engagement at the May and ISA Dimensional Levels (n=67)

	Engagement (May Scale - Physical)			**Engagement (May Scale - Emotional)**			**Engagement (May Scale - Cognitive)**		
	B	***SE B***	***β***	***B***	***SE B***	***β***	***B***	***SE B***	***β***
Workplace Stress	.071	.119	.074*	-.319	.114	.-329**	-.215	.116	-.224*
R^2		.005			.108			.05	
Predictor	**Engagement (ISA Scale - Intelletctual)**			**Engagement (ISA Scale - Social)**			**Engagement (ISA Scale - Affective)**		
	B	***SE B***	***β***	***B***	***SE B***	***β***	***B***	***SE B***	***β***
Workplace Stress	-.341	.233	-.178*	-.881	.286	-.357***	-.955	.226	-.465****
R^2		.032			.127			.216	

* p>.05 **p=.007 ***p=.003 ****p<.001

The remaining hypotheses (H_{3a}-H_{3b}, H_{4a}-H_{4c} and H_{5a}-H_{5c}) were aimed at examining whether the mediator of burnout, as measured by the exhaustion dimension of the OLBI Scale (Demerouti et al., 2010), accounted for the differences in employee engagement perceptions. A four-step test for mediation for each overall engagement scale and dimensional subscale was conducted in accordance with Barron & Kenny's (1996) approach.

The results of the mediation test with the overall May Scale (H_{3a}) failed to establish a statistically significant relationship between workplace stress and employee

engagement (β=-.192, p=.12), so this hypothesis failed. However, in the mediation test with the overall ISA Scale (H_{3b}), statistically significant associations were found for workplace stress and employee engagement (β=-.409, p=.001), workplace stress and burnout (β=.617, p<.001), and burnout and employee engagement (β=-.313, p=.01). Having satisfied these three relationships, the fourth step of the mediation test revealed that the relationship between workplace stress and overall ISA engagement was weaker, but significant, in the presence of burnout (β=-.349, p=.019) suggesting that burnout partially mediated the relationship between workplace stress and overall employee engagement. In the mediation validation step with the Sobel test (Kristopher J. Preacher & Leonardelli), the results failed to produce a significant result. However, since this test works best in large samples and the pilot study had a relatively small sample size, the presence of burnout as a partial mediator between workplace stress and the overall ISA engagement is still in question. This result tentatively confirmed the partial mediation hypothesis (H_{3b}) as it relates to the ISA Scale measurement of employee engagement. Table 7 summarizes the results of the mediation tests on the May and ISA overall measures of engagement.

Table 7. Pilot: Testing for Mediator Effects on the May and ISA Measures of Engagement Using Multiple Regression (n=67)

	----- Engagement (May Scale) -----				----- Engagement (ISA Scale) -----			
Testing Steps for Mediation	***B***	***SE B***	***95% CI***	***β***	***B***	***SE B***	***95% CI***	***β***
Step 1								
Outcome: Employee Engagement	-.137	.087	-.311, .037	-.192*	-.726	.201	-1.126, -.325	-.409**
Predictor: Workplace Stress								
Step 2								
Outcome: Burnout		Not tested due to			.388	.061	.265, .510	.617***
Predictor: Workplace Stress		non-significance of Step 1						
Steps 3 and 4								
Outcome: Employee Enagement		Not tested due to			-.883	.332	-1.547,-.220	-.313****
Mediator: Burnout		non-significance of Step 1						
Predictor: Workplace Stress					-.619	.256	-1.130, -.107	-.349*****

* p>.05 **p=.001 ***p=<.001 ****p=.01 *****p=.019

To further examine the indirect effect of burnout on employee engagement, similar mediation tests were conducted for each dimension of the May (H_{4a}-H_{4c}) and ISA Scales (H_{5a}-H_{5c}). For the physical and cognitive dimensions of the May Scale, no statistically significant relationships were found between workplace stress and employee engagement (β=.074, p=.553 for the physical dimension and β=-.224, p=.068 for the cognitive dimension). However, in the mediation test with the May emotional dimension, statistically significant associations were found for workplace stress and emotional engagement (β=-.329, p=.007), workplace stress and burnout (β=.617, p<.001), and burnout and emotional engagement (β=-.284, p=.02). Having satisfied these three relationships, the fourth step of the mediation test revealed that the relationship between the workplace stress and emotional engagement was non-significant in the presence of burnout (β=-.248, p=.101) suggesting that burnout completely mediated the relationship between workplace stress and the emotional dimension of the May Scale. However, the mediation results with the May emotional dimension may be questionable

given the previously mentioned reliability challenges with the subscale. Table 8 summarizes the results of the mediation tests for the each dimension of the May Scale which failed to support hypotheses H_{4a} and H_{4c}, but tentatively supported H_{4b}.

Table 8. Pilot: Testing for Mediator Effects on May Subscale Dimensions Using Multiple Regression (n=67)

	-------- Physical Engagement --------				-------- Emotional Engagement --------				-------- Cognitive Engagement --------			
Testing Steps for Mediation	***B***	***SE B***	***95% CI***	***β***	***B***	***SE B***	***95% CI***	***β***	***B***	***SE B***	***95% CI***	***β***
Step 1												
Outcome: Employee Engagement	.071	.119	-.166, .308	.074*	-.319	.114	-.546, -.092	-.329**	-.215	.116	-.446, .017	-.224*
Predictor: Workplace Stress												
Step 2												
Outcome: Burnout		Not tested due to			.388	.061	.265, .510	.617***		Not tested due to		
Predictor: Workplace Stress		non-significance of Step 1								non-significance of Step 1		
Steps 3 and 4												
Outcome: Employee Engagement		Not tested due to			-.438	.183	-.805, -.072	-.284****		Not tested due to		
Mediator: Burnout		non-significance of Step 1								non-significance of Step 1		
Predictor: Workplace Stress					-.241	.145	-.530, .048	-.248*				

* p>.05 **p=.007 ***p<.001 ****p=.02

Similar mediation tests were conducted for each dimension of the ISA Scale (H_{5a}-H_{5c}). For the intellectual dimension, no statistically significant relationship was found between workplace stress and intellectual engagement (β=-.178, p=.149). For the social dimension, statistically significant associations were found between workplace stress and social engagement (β=-.357, p=.003), workplace stress and burnout (β=.617, p<.001). However, no statistically significant relationship was found between burnout and social engagement (β=-.186, p=.131). These results failed the four-step mediation test and, as such, fail to support burnout as a mediator between either workplace stress and intellectual engagement (H_{5a}) or workplace stress and social engagement (H_{5b}).

In the mediation test with the affective dimension of ISA engagement, statistically significant associations were found for workplace stress and affective engagement (β=-.465, p<.001), workplace stress and burnout (β=.617, p<.001), and burnout and affective

engagement (β=-.491, p<.001). Having satisfied these three relationships, the fourth step of the mediation test revealed that the relationship between the workplace stress and affective engagement was non-significant in the presence of the burnout (β=-.261, p=.057) suggesting that burnout completely mediated the relationship between workplace stress and the affective dimension of the ISA Scale (H_{5c}).

Table 9 summarizes the results of the mediation tests for each dimension of the ISA Scale which failed to support the mediation hypotheses H_{5a} and H_{5b} for two of the employee engagement dimensions, but did confirm full mediation for the affective dimension (H_{5c}).

Table 9. Pilot: Testing for Mediator Effects on ISA Subscale Dimensions Using Multiple Regression (n=67)

	-------- Intellectual Engagement --------				-------- Social Engagement --------				-------- Affective Engagement --------			
Testing Steps for Mediation	***B***	***SE B***	***95% CI***	***β***	***B***	***SE B***	***95% CI***	***β***	***B***	***SE B***	***95% CI***	***β***
Step 1												
Outcome: Employee Engagement	-.341	.233	-.806, .125	-.178*	-.881	.286	-1.453, -.310	-.357**	-.955	.226	-1.405, -.504	-.465***
Predictor: Workplace Stress												
Step 2												
Outcome: Burnout		Not tested due to			.388	.061	.265, .510	.617***	.388	.061	.265, .510	.617***
Predictor: Workplace Stress		non-significance of Step 1										
Steps 3 and 4												
Outcome: Employee Engagement		Not tested due to			-.733	.479	-1.689, .224	-.186*	-1.607	.353	-2.312, -.901	-.491***
Mediator: Burnout		non-significance of Step 1										
Predictor: Workplace Stress						Not tested due to non-significance of Step 3			-.535	.276	-1.087, .016	-.261*

* p>.05 ** p=.003 ***p<.001

Discussion and Conclusions Associated with the Pilot Study

The results of the pilot supported that there is a negative relationship between workplace stress and ISA employee engagement, as predicted by Hypothesis H_{1b}. This finding is particularly apparent at the dimensional levels of the employee engagement measurement scale (Table 10). The results also supported the contention that the

mediating effects of burnout differ depending on the engagement domain or dimension. The presence of burnout had no statistical effect on the negative relationship between workplace stress and the ISA dimension of social engagement in the pilot; however, this relationship needs further testing to confirm whether burnout plays no role or a partial role as hypothesized.

Table 10. Pilot: Summary

Employee Engagement	**Relationship to Workplace Stress**	**---------- Burnout Effects ----------**			
		Step 1	**Step 2**	**Step 3**	**Step 4**
May Scale - Overall	ns	ns			
May Scale - Cognitive	ns	ns			
May Scale - Emotional	sig	sig	sig	sig	Complete Mediation
May Scale - Physical	ns	ns			
ISA Scale - Overall	sig	sig	sig	sig	Partial Mediation
ISA Scale - Intellectual	ns	ns			
ISA Scale - Social	sig	sig	sig	ns	
ISA Scale - Affective	sig	sig	sig	sig	Complete Mediation

ns=non significant sig=significant

Influence of the Pilot Study on This Study

The pilot study successfully tested the plausibility of the hypothesized relationships but also suggested a number of changes designed to improve the reliability of the larger study. The pilot utilized the May Scale (May et al., 2004) as a needs-satisfaction based measurement of engagement to compare to the ISA Scale (Soane et al., 2012). The results of May Scale at the overall level showed no relationship with workplace stress. Yet the emotional dimension, which evidenced weak reliability (α=.502) according to the .70 threshold of J. Cohen et al. (2003), indicated a significant

relationship with workplace stress. The problems experienced in the pilot study with the May Scale may be related to the small sample size, but similar reliability challenges were reported by other researchers (Shuck & Owen, 2013; Viljevac et al., 2012). This led to the decision to replace it in this study with the Rich Scale—a measurement instrument similarly conceptualized, but with better overall and dimensional reliabilities (Rich et al., 2010).

The pilot study also employed the eight item exhaustion dimension of the OLBI as its measure of burnout. In order to avoid the potential for confusion that may arise through the use of a burnout measure that has also been used to measure engagement through its reverse scores (Demerouti & Bakker, 2007), this study substituted the BMS, a shorter version of the BM, as another measure that operationalizes an exhaustion-based conceptualization of burnout (Malach-Pines, 2005; Pines & Aronson, 1988).

High bivariate correlations between workplace stress and burnout were evidenced in the pilot study (Table 3 and Table 4). Although expected, this study further analyzed these two constructs so as to mitigate the risk that the findings were impacted by the presence of multicollinearity. Finally, the small sample size of the pilot study necessitated the use of multiple regression as an analysis approach. However, this study made use of the more robust data analysis approaches of CFA and SEM to test and compare the hypothesized relationships.

Design of the Study

This research study was an *a priori* theory-based, quantitative design. To test the hypotheses, responses from a cross-section of IT professionals working in U.S.

community hospitals were collected. To address one of the main goals of the study, only IT professionals who were working in community hospitals that were implementing EHRs were sampled. The choice of a quantitative study design was appropriate given that existing theory drove data collection, and the relationships between the variables were tested to see how the application of different employee engagement measures impacted the results (Bryman & Bell, 2011). Further, the study aimed to produce findings and conclusions that are generalizable to the broader population of IT professionals working in U.S. community hospitals (Bryman & Bell, 2011).

Population and Sample

The context for the study was the stress-charged environment of IT professionals working on EHR implementations in community hospitals in the United States. Therefore, the population to be studied represents the approximately 100,000 IT professionals working in the almost 5,000 U.S.-based community hospitals or hospital systems (AHA, 2013). This particular population was chosen because the IT professionals working to support EHR-related technologies and processes represent a fairly homogenous group across the U.S. Regardless of the hospital for which they work, they are confronted with similar technologies, clinical workflows and objectives for implementation (Blumenthal & Tavenner, 2010). They are also facing the same time pressures, working with the same complement of end-users, and experiencing many of the same stress factors (Anthony et al., 2014).

The study sought to recruit respondents from a sample of hospitals that generally reflects the overall U.S. community hospital population. As depicted in Figure 9, U.S.

community hospitals are somewhat unequally represented in terms of inpatient beds—a common metric of relative size. In addition, many small hospitals are actually members of a larger hospitals system and, in those cases, the IT departments are typically organized at the corporate level, not at the individual hospital level. Similarly, the geographic distribution of U.S. hospitals is also unequal (AHA, 2013; AHD, 2013; CDC, 2011). Nevertheless, community hospitals or hospital systems were targeted to reflect a representative quota sample in terms of size and geographic location.

Figure 9. U.S. Community Hospitals by Bed Size and Geographic Region

A quota sample was appropriate because it aimed to reflect the larger population in terms of proportions of organizations in specific categories (Bryman & Bell, 2011). In this study, the desired sample reflected the relative size and location of the U.S. community hospital population but only included those hospitals implementing EHRs. Given that this sampling procedure was not random, there are limits to its generalizability. However, this study's quotas were based upon largely objective factors, so the potential for bias is limited (Bryman & Bell, 2011).

Within these size and location parameters, community hospitals or hospital systems were identified for inclusion in this study's quota sample based on the

confirmation that EHR implementations were actively underway. This confirmation occurred through discussions with Chief Information Officers (CIOs), or other senior IT executives, at healthcare IT-related conferences such as CHIME (College of Healthcare Information Management Executives) or HIMSS (Healthcare Information Management and Systems Society). Recent studies confirmed that 44% of all U.S. hospitals had basic EHRs installed ("Health information technology in the United States: Better information for better care," 2013).

The minimum number of survey respondents required for the study was 160, but the study sought to obtain approximately 350 respondents. The minimum sample size was determined by reviewing the measured effect sizes from other engagement-related studies and from targeting a statistical power level of .8 with a significance level of .05 (Friedman, 1982). The effect sizes from actual studies in which engagement was an outcome variable ranged from .35 to .78. The 2013 pilot study revealed a measured effect size of .4, so in consideration for a more rigorous test, the lower range of .4 was used to determine the minimum sample size. Using the GPower 3.1 tool, the minimum sample size was calculated to be 44, but an additional 100 responses were needed to support the testing requirements of structural equation modeling (Hair et al., 2010). Further, another 10% was required to account for the possibility of unusable or incomplete survey responses leading to the total minimum sample size of 160. Nevertheless, to improve the potential for better generalizability, the study sought approximately 350 respondents from U.S. community hospitals working on EHR implementations.

Seventy-four community hospitals (or hospital systems), based upon sizes and locations that approximated the U.S. hospital market (Table 11), were identified for potential participation. The average community hospital employs approximately .2 IT professionals per hospital bed (Hersh & Wright, 2008). Response rates by individuals for surveys used in organizational research typically averages 50% and is often higher for online surveys (Baruch & Holtom, 2008). This study estimated a 35% response rate which meant that recruiting approximately 1,000 IT professionals should yield the desired number of 350 participants. Assuming that approximately 40 of the 74 hospitals actually participated and given their relative sizes and the staffing ratio of .2/bed, it was estimated that approximately 1,140 IT professionals would be available to recruit for survey participation.

Table 11. Distribution of Hospitals Targeted for Participation Based on Quota Sample

Bed Size	Number of Hospitals/Hospital Systems	Location	Number of Hospitals/Hospital Systems
Under 50	12	Northeast	6
50 -99	8	Midwest	10
100-199	8	South	16
200-299	6	West	8
300+	6		

Measurement Instruments

A web-based survey (administered through surveymonkey.com) contained questions consisting of two types. The first type reflected opinion questions which were presented and ranked on Likert scales ranging from “Strongly Disagree” to “Strongly Agree” or “Never” to “Always” (Appendix J). A few questions were scored on the

reverse scale (in accordance with the original instrument developers' design) and no free text responses were collected. Also, in order to minimize the risk of bias due to common method variance, the questions that measured the dependent variables (employee engagement) were positioned before those related to the independent variables (workplace and burnout) in the survey (Podsakoff et al., 2003). The second type included general demographic and other descriptive questions which served as control variables. These questions, answered via multiple choice options, related to gender, age, organizational tenure, education, client interaction, supervisory status and a number of organizational factors.

The opinion questions related to the constructs under examination were derived from the following published and empirically validated instruments. Unless specifically noted, all of these survey instruments are in the public domain and did not require the authors' permission to use (complete scales in Appendices C-F).

Workplace Stress

The recently developed Workplace Stressors Assessment Questionnaire (α=.95) was utilized to assess self-reported perceptions of workplace stress. This instrument consists of 22 items and was tested with high-tech employees at a U.S. governmental worksite (Mahmood et al., 2010). The choice of this instrument was determined by its theoretical underpinning in COR and its psychometric development specifically with high-tech employees. All 22 questions were included in this study. Responses were scored on a 5 point Likert scale with lower numbers indicating higher stress; however, these responses were recoded so that higher numbers equaled higher stress. An example

question is “My work demands affect my personal relationships” (Mahmood et al., 2010). The authors of this instrument granted permission for its use in this study (Appendix I).

Burnout

The Burnout Measure, Short Version (BMS) (Malach-Pines, 2005) was selected because it is consistent with this study’s exhaustion-based conceptualization of burnout (Pines & Aronson, 1988). Unlike other widely-used measures of measures, such as the MBI and OLBI, the BMS (which is the shorter version of the widely-accepted BM) has not also been used as a proxy for engagement (through the examination of reverse scores). Therefore, the selection of this instrument avoided the possibility of confounding the studied relationships between burnout and the needs-satisfaction based operationalizations of employee engagement. The BMS (α=.85) includes 10 items which were scored on a 7 point Likert scale with higher scores indicating higher burnout. A sample question is, “When you think of your work overall, how often do you feel tired?” (Malach-Pines, 2005).

Employee Engagement

Two measures of engagement were used in this study. The Rich Scale (α=.95) was developed in congruence with Kahn’s (1990) needs-satisfaction framework and tested with 245 firefighters and their supervisors (Rich et al., 2010). Like the similarly conceptualized May Scale, the Rich Scale also includes physical, emotional and cognitive dimensions, but showed stronger overall reliability and better evidence of the reliability of its three separate dimensions (Shuck & Twyford, 2013). Further, the results of the 2013 pilot study revealed inconsistent findings with the use of the May Scale.

All 18 items from the Rich Scale were included in this study. Responses were scored on a 5 point Likert scale with higher numbers indicating higher employee engagement. A sample question from the physical dimension is, "I exert my full effort to my job". A sample from the emotional dimension is, "I am excited about my job", and a sample from the cognitive dimension is, "At work, I am absorbed by my job" (Rich et al., 2010).

The second engagement scale was the ISA Scale (α=.91) (Soane et al., 2012). This scale was recently developed and tested among 540 employees in a U.K.-based manufacturing company and was of particular interest because, like the Rich Scale, its development was underpinned by the work of Kahn (1990). This instrument includes intellectual and affective domains that are similar to the cognitive and emotional domains in the Rich Scale, but also includes a social dimension reflecting the researchers' belief, also in accordance with Kahn (2007b), that employees need to work positively and collectively with shared values, goals and attitudes as their co-workers. The ISA Scale was successfully tested in the 2013 pilot study.

The ISA Scale includes nine questions divided into its three domains or dimensions (Soane et al., 2012). All nine questions were included in this study. Responses were scored on a 7 point Likert scale with higher numbers indicating higher employee engagement. A sample question from the intellectual dimension is, "I focus hard on my work", and a sample from the affective dimension is, "I feel positive about my work". The social dimension appears to reflect the element of positive interpersonal relationships that Kahn (1990) saw as fundamental to an employee's willingness to

engage at work. The three questions that comprise the social dimension are "I share the same work values as my colleagues", "I share the same work goals as my colleagues", and "I share the same work attitudes as my colleagues" (Soane et al., 2012).

Control Variables

In order to rule out alternative explanations for the relationships between the employee engagement dependent variables and the independent variables of workplace stress and burnout, a number of demographic and job characteristics variables were collected. Demographic variables included gender, age, tenure, and education. Variables related to job characteristics included job role, client interaction and supervisory status.

These particular control variables were selected because previous studies indicated that they may impact the relationships under examination. For example, in studies in which engagement was an outcome, the variables of gender, age, education, tenure and supervisory status were considered (Rich et al., 2010; Shuck, Reio, et al., 2011; Soane et al., 2012). Of note, all of these control variables were included in the hierarchical regression equations between the independent variables and the dependent variables in the 2013 pilot study but evidenced no significant effect.

As a quota sample of community hospitals reflecting the overall population of U.S. community hospitals in terms of inpatient bed size and geographic location was sought, variables related to bed size and location were also collected. Although all community hospitals must implement an EHR that has been certified against federal standards, another control variable related to the actual EHR system being implemented was captured (Blumenthal & Tavenner, 2010).

Data Collection Procedures

Written approval was sought from the CIOs of each targeted hospital to conduct the study with their IT employees and for the recruited employees to complete the web-based survey during work hours. Individual survey participants were then recruited via email from the entire IT employee populations of the participating hospitals. If the approval of individual employee supervisors was required, that fact was verified during the recruitment process and appropriate steps were taken to secure such permission. An email, drafted by the researcher (Appendix A), was sent from the CIOs to all of their IT employees with a request to participate in the study. A follow-up email was sent two weeks after the initial email. The email contained a link to the web-based survey instrument and, to reduce the potential for bias due to social desirability (Tsai & Ghoshal, 1998), it informed potential study participants that 1) taking part in the web-based survey was completely voluntary; 2) no incentives were provided for participation; 3) all survey responses were confidential; and, 4) all results would be reported at aggregate levels (Bryman & Bell, 2011).

The survey was accessible from any web browser and took approximately 10-15 minutes to complete. Recruited participants were informed that they could decline to participate or withdraw at any time without consequence. Potential participants had the option of not clicking on the survey link embedded in the recruitment email, or clicking the link to connect to the web-based survey. Those that clicked the link were presented with an Informed Consent (Appendix B) at the start of the survey with instructions about how to continue or withdraw from the study. Even those participants that clicked the

survey link and accepted the Informed Consent could still withdraw at any time by clicking the EXIT button in the top right-hand corner of the survey or by closing the browser.

Survey responses were confidential and no identifying information such as name, hospital name, email address, computer number or IP number was collected. Each survey response contained a numerical identifier, but there was no connection between that numerical identifier and the identity of the individual respondent. The survey instrument and respondent data were hosted by surveymonkey.com on a secure, encrypted and password-protected site, and all data were collected through an SSL-encrypted tunnel. Further, the instrument was configured in surveymonkey.com to limit responses to one response per computer IP number to avoid the potential for multiple responses from the same participant.

Survey responses were confidential and seen only by the research team at The University of Texas at Tyler, and all collected information was kept secured, private and used only for this research study. Although the participants may have been located in a hospital-related setting, no protected health information (PHI) was discussed or collected. Finally, the study was conducted under the review and approval of the Institutional Review Board of The University of Texas at Tyler.

Data Analysis Procedures

Collected data were reviewed for completeness and for the presence of any outliers. The data were also validated and the analysis began with a review of the descriptive statistics, including means, standard deviations and zero-order correlation

coefficients (J. Cohen et al., 2003; Hair et al., 2010). Prior to performing any statistical analyses, the following assumptions were tested and verified: reliability of the scales and subscales, linearity of the relationships between the independent and dependent variables, absence of multicollinearity, homoscedasticity, normality of the dependent variables, and independence of the independent variables. These assumptions are fundamental to multivariate analysis and designed to ensure that the potential for "distortions or bias" (p. 70), inherent when a large number of variables is analyzed, is limited (Hair et al., 2010).

Further analysis was conducted in a number of phases. First, measurement models were defined *a priori* in order to determine how well the observed items in each measurement instrument served as indicators of the latent variables they were intended to measure (Joresborg & Sorbom, 1993). These models were analyzed using confirmatory factor analysis (CFA) in LISREL (version 9.1) and in accordance with Hair et al. (2010). Next, the relationships between workplace stress, burnout and the two operationalizations of employee engagement were tested by a number of statistical methods including correlation analysis, exploratory factor analysis and multiple hierarchical regression in SPSS (version 22), maximum likelihood structural equation modeling (SEM) in LISREL (version 9.1) and bootstrapping in SPSS using the INDIRECT macro developed by K. J. Preacher and Hayes (2004).

SEM was particularly appropriate for use in this study because it minimizes the impact of measurement error (Schumacker & Lomax, 2010), remains robust in the presence of multicollinearity and supports tests for bias due to common method variance (Conway & Lance, 2010; Podsakoff et al., 2003). The various structural models were

developed, analyzed and compared in order to identify any statistically significant differences in the underlying nomological frameworks. Finally, tests for the indirect effect of burnout on the relationships between workplace stress and employee engagement were conducted in accordance with the multi-step approach of Hair et al. (2010) using SEM and bootstrapping analysis (K. J. Preacher & Hayes, 2004).

Reliability and Validity

The stability and internal reliability of the study's findings were attained through the use of empirically tested measurement instruments whose Cronbach's alpha scores were .7 or better (Bryman & Bell, 2011). Further, a common web-based survey instrument and instructions were administered to all study participants so as to minimize any concerns with inter-observer consistency (Bryman & Bell, 2011). The face validity of the four measurement instruments was also reasonable. The risk of common method bias was tested by means of both the Harman single-factor test and the common latent factor test (Podsakoff et al., 2003), and the risk of non-response bias (both from non-participating hospitals and from non-participating IT employees) was tested using independent samples *t*-tests (J. Cohen et al., 2003).

Internal and convergent validity was established by using CFA to calculate composite reliabilities, communalities, and percentage of average variance extracted for all of the constructs (Hair et al., 2010). The findings from the 2013 pilot study revealed high bivariate correlations between workplace stress and burnout, and this is consistent with the literature which suggests that stress and burnout are highly interrelated (Gorgievski & Hobfoll, 2008). But, to address the risk that the results of the study might

be influenced by the presence of multicollinearity, the discriminant validities of all of the constructs were confirmed by means of CFA and in accordance with Hair et al. (2010).

The intent of this study was not to examine the between-organizational effects on the variables. However, in order to control for the possibility of bias due to multi-level effects from survey respondents who were nested in different hospital organizations, intraclass correlation coefficients (ICC1 and ICC2) were calculated for each hospital or hospital system that participated in the study (McGraw & Wong, 1996; Shrout & Fleiss, 1979). These coefficients, a measure of interrater reliability, calculate the proportion of variance that is attributable to the survey respondents themselves. If the ICCs between participating organizations are non-significant, the potential for bias due to multi-level effect is low (Landers, 2011; Shrout & Fleiss, 1979).

Limitations

Although efforts to ensure a rigorous and generalizable study were made, some limitations are noteworthy. These limitations include the use of self-report data which introduced the possibility of bias due to common method variance (Podsakoff et al., 2003). However, Spector (1987) suggested that this issue is more problematic when using poorly designed measurement scales, and Doty and Glick (1998) suggested that whereas common method variance may introduce some bias, it is rarely significant enough to affect the overall findings of research studies. This risk appears to be minimal given that 1) all the scales evidenced high reliability in prior studies; 2) the survey questions in the study were intentionally ordered to reduce the potential for bias; 3) each for the four scales has different response options; and 4) the risk of this bias was tested

via the Harmon single-factor test and the common latent factor test (Conway & Lance, 2010; Podsakoff et al., 2003).

As a cross-sectional study, there is some risk that other explanations for the observed relationships are possible although this was mitigated by fact that the hypothesized relationships were theory-based (Bryman & Bell, 2011). There was also a risk of unintentional bias from the survey respondents as CIOs or other IT executives sponsored their hospitals' participation and assisted in the recruitment of their staffs. Efforts to minimize this risk were employed including guarantees of voluntary participation and complete confidentiality of all responses.

The study's survey participants are considered to be a random sample because all IT professionals in each participating hospital were invited to participate, but the use of quota sampling for the recruitment of participating hospitals introduced a potential for bias as this is a non-random sampling approach. However, as the categories targeted by this sampling approach were largely objective (that is, not based upon the researcher's perceptions or observations), the risk of this bias is limited (Bryman & Bell, 2011). The potential for non-response bias was also tested and found to be low, but this risk cannot be completely ruled out. As the survey respondents were employed and thus nested in different hospital organizations, there is a risk of bias due to multi-level effect. This risk was mitigated by the relative homogeneity of the population under study and the consideration of certain organization-level control variables, but was examined through the calculation of intraclass correlation coefficients (Shrout & Fleiss, 1979).

The Workplace Stressors Assessment Questionnaire is a new instrument designed specifically to measure stress among high-tech professionals (Mahmood et al., 2010). Similarly, the ISA Scale is also new and has not been tested since its original psychometric development (Soane et al., 2012). The reliability of both instruments was very high in initial testing (α=.95 and .91, respectively), and the application of these instruments was appropriate for this study. Although this study provides further evidence of the psychometric soundness of these two measures, there is risk as to their generalized validities.

This study also utilized the BMS as its measure of burnout specifically because its authors did not intend that it also be used to measure the opposite of engagement (Malach-Pines, 2005; Pines & Aronson, 1988). However, this measure is less frequently cited in the scholarly literature (Schaufeli & Buunk, 2002). Since most empirically tested burnout measures are based largely upon emotional exhaustion, it is likely that this study's findings would be similar with other burnout measures (such as the OLBI or the MBI) that have been used to measure engagement through their reverse scores. Nevertheless, the use of the BMS represents another limitation of this study.

One of the major assumptions of this study was that the relationship between workplace stress and employee engagement is linear. However, there may be certain circumstances in which workplace stress and engagement exhibit a curvilinear relationship (Bryman & Bell, 2011). For example, it is possible that lower levels of stress may evidence a positive relationship with employee engagement whereas higher levels exhibit a negative relationship (Nelson & Simmons, 2003). This study did not consider

the possibility of a curvilinear relationship between these variables, but this phenomenon may represent an interesting topic for future research and study.

Finally, the population of this study encompassed IT professionals working to implement EHRs in U.S.-based community hospitals. Therefore, the findings from this study can be generalizable to IT professionals working in this context, but future researchers should examine whether the same similarities and/or differences in the examined relationships would hold among other occupational groups and among those working in other industries, other jobs, different countries and/or under different circumstances.

Summary of the Chapter

This chapter provided an outline of the design for the study. It began with a review of the purpose of the study and then presented the research hypotheses. An overview of a pilot study conducted in 2013 was presented. The pilot pre-tested the hypothesized relationships in this study and its findings both influenced the choice of measurement instruments and suggested a more robust set of statistical testing methods for this study. The chapter discussed the population and sample for this study and presented details about the instrumentation and measurement of responses. The methods used to ensure both reliability and validity, the data collection procedures and the planned data analyses were also discussed. Finally, the chapter concluded with a discussion of the limitations associated with this study.

Chapter 4 – Findings

Introduction

This chapter presents the results from the analysis of the data collected in support of this study. The chapter begins with a discussion of the demographics associated with the participating hospitals and IT professionals. It continues with a review of the assumptions, reliabilities and validities that were tested and describes how these elements were tested and evaluated. The approaches to testing the hypothesized relationships is then presented followed by the detailed examination of these relationships. The chapter concludes with a summary.

Demographics of Participating Hospitals and IT Professionals

A total of 74 hospitals were recruited to participate in the survey, and 45 hospitals (representing seven different hospital systems) agreed to participate. These 45 hospitals employ approximately 2,430 IT professionals and all were recruited to participate in the survey. In terms of the 29 hospitals that chose not to participate, the CIOs from these hospitals offered reasonable explanations for non-participation including that they were traveling during the survey period and would be unable to recruit their staffs and, in a number of cases, that their organizations had already conducted or were about to conduct their own employee engagement surveys. However, all of these CIOs confirmed that, like those hospitals that participated, their hospitals are working through difficult EHR-

related activities, they are concerned about the impact of stress and burnout on the engagement of their staffs, and they are very interested in the findings of this study.

With the following exceptions, the 45 participating hospitals are generally similar in bed size and geographic distribution to the U.S. community hospital market (Figure 9). As shown in Table 12, five of the 45 hospitals are in the 50-99 bed size range which is below the national average of 20% for that size range, and twelve of the 45 are in the 300+ bed size range which exceeds the national average of 16% for that size range. This skew toward larger hospitals is consistent with national statistics which indicate that larger hospitals are more likely to be implementing EHRs than smaller ones (King & Adler-Milstein, 2013). It also explains the relatively high number of total IT professionals as larger hospitals employ a higher percentage of IT professionals/bed than their smaller counterparts (Hersh & Wright, 2008). In terms of region, fourteen of the 45 hospitals participated from the South which is below the national average of 43% from the South, and thirteen of the 45 participated from the Northeast which exceeds the national average of 16% from the Northeast. Nevertheless, the distribution of hospital participants fairly approximates the U.S. hospital market in terms of both bed size and geographic location.

Table 12. Distribution of Actual Hospital Participants (n=45)

Bed Size	Number of Hospitals/Hospital Systems	%
Under 50	12	27%
50 -99	5	11%
100-199	10	22%
200-299	6	13%
300+	12	27%

Location	Number of Hospitals/Hospital Systems	%
Northeast	13	29%
Midwest	12	27%
South	14	31%
West	6	13%

Of the 2,430 IT professionals recruited from the 45 hospitals, 630 participated in the survey representing a 26% response rate. However, 158 of the responses were unusable because more than 50% of the data were missing (Bryman & Bell, 2011). These responses were eliminated resulting in a total of 472 usable responses which is considered to be a large sample size for multivariate analysis (Hair et al., 2010). Of those that completed the survey, 199 (42%) were female and 273 (58%) were male, the mean age was 46 (SD=10.08), and the mean organizational tenure was 10 years (SD= 9.02). Twenty-seven (6%) respondents graduated from high school, 100 (21%) attended college, 238 (50%) had an undergraduate degree, and the remaining 107 (23%) started or completed a graduate degree. Four hundred and nine (87%) respondents indicated that they worked directly with clients in some capacity whereas the other 63 (13%) did not, and 123 (26%) respondents worked in some supervisory or managerial capacity.

The generalizability of research findings is improved when the risk of non-response bias is low (Bryman & Bell, 2011). As stated above, 45 out of 74 recruited hospitals participated in this study. The 29 non-participating hospitals were distributed similarly to the participating hospitals in terms of bed size and geographic location, and an independent samples *t*-test revealed that the difference in the mean number of IT employees in both groups was non-significant (t=.515, p=.618) (Cohen, Cohen, West, & Aiken, 2003). Therefore, it is reasonable to assume that, had these hospitals participated, the findings would have been the same.

Within the 45 participating hospitals, 26% of their IT professionals completed the survey. To test for the possibility of non-response bias, a time trend extrapolation

analysis was conducted (Armstrong & Overton, 1977). To accomplish this, survey respondents were split into two groups: those that completed the survey prior to the reminder email which was sent two weeks after the initial invitation to participate (early respondents), and those that completed the survey after the reminder email was sent (late respondents). This analysis assumes that late respondents are similar to non-respondents given that late respondents would have been non-respondents had they not received the reminder email (Armstrong & Overton, 1977). The means for the two overall engagement measures (Rich Scale and ISA Scale) were then compared for the two groups using independent samples *t*-tests (J. Cohen et al., 2003). With both engagement measures, Levene's tests confirmed that the variances between the two groups of respondents were equal. Further, both engagement measures evidenced non-significant differences in the means between the two groups of respondents (Rich Scale: t=-.152, p=.879; ISA Scale: t=1.220, p=.223). These findings support the assumption that the risk of non-response bias is low.

Assumptions, Reliability and Validity

Prior to the statistical analysis of the hypothesized relationships, assumptions that are fundamental to multivariate analysis were tested (J. Cohen et al., 2003). Specifically, the normal distribution of the data was confirmed with skewness (Z values from -1.681 to .520) and kurtosis (Z values from -.374 to 4.227) ranging within acceptable limits (J. Cohen et al., 2003). Further, homoscedasticity was supported with non-significant Levene's test values, the absence of multicollinearity was confirmed with tolerances greater than .20 and variance inflation factors less than 5.0, the independence of the

errors was confirmed with Durbin-Watson values close to 2.0, and the independence of the variables was confirmed with Mahalanobis D^2 results within the limits appropriate for the specified number of degrees of freedom (J. Cohen et al., 2003).

Next, the scale reliabilities were estimated by both Cronbach's alphas and zero-order correlation coefficients using SPSS (version 22). Table 13 and Table 14 present the descriptive statistics and zero-order correlation coefficients for the independent variables of workplace stress and burnout and the various outcome variables related to employee engagement as measured by the Rich and ISA scales at the overall and subscale levels. Of note, the following measurement instruments were used in this study: the Workplace Stressors Assessment Questionnaire, scored from 1 to 5 (Mahmood et al., 2010); the Burnout Measure, Short Version, scored from 1 to 7 (Malach-Pines, 2005); the Rich overall engagement scale and subscales, scored from 1 to 5 (Rich et al., 2010); and, the ISA overall engagement scale and subscales, scored from 1 to 7 (Soane et al., 2012).

Table 13. Descriptive Statistics, Reliabilities and Zero-Order Correlation Coefficients of and Among the Study Variables with Engagement Measured by the Rich Scale (n=472)

	M	***SD***	***1***	***2***	***3***	***4***	***5***	***6***
1. Workplace Stress	2.63	.67	.92					
2. Burnout	3.01	1.10	.71**	.92				
3. Physical Engagement	4.54	.52	-.05	-.05	.88			
4. Emotional Engagement	4.15	.74	-.48**	-.55**	.50**	.92		
5. Cognitive Engagement	4.34	.60	-.10*	-.10*	.73**	.50**	.93	
6. Overall Rich Engagement	4.34	.52	-.28**	-.31**	.85**	.83**	.86**	.94

Note: Cronbach's alphas (α) are presented diagonally.
*p<.05 **p<.01

Table 14. Descriptive Statistics, Reliabilities and Zero-Order Correlation Coefficients of and Among the Study Variables with Engagement Measured by the ISA Scale (n=472)

	M	*SD*	*1*	*2*	*3*	*4*	*5*	*6*
1. Workplace Stress	2.63	.67	.92					
2. Burnout	3.01	1.10	.71**	.92				
3. Intellectual Engagement	6.36	.78	-.17**	-.18**	.94			
3. Social Engagement	4.96	1.35	-.43**	-.34**	.18**	.93		
5. Affective Engagement	5.80	1.18	-.44**	-.53**	.52**	.42**	.91	
6. Overall ISA Engagement	5.71	.85	-.49**	-.48**	.64**	.78**	.85**	.87

Note: Cronbach's alphas (α) are presented diagonally.
**p<.01

As shown above, Cronbach's alphas for the scales range from .87 to .94 which exceed the statistically acceptable lower limit of .70 (J. Cohen et al., 2003). With the exception of the non-significant correlations between the Rich subscale of physical engagement and both workplace stress and burnout, all other correlations are significant and within acceptable ranges. As expected, the correlations between both measures of overall engagement and each of their subscales are relatively high (*r* ranging from .64 to .86). Although the bivariate correlation between workplace stress and burnout is also relatively high (*r*=.71), this value is consistent with the literature which suggests that stress and burnout are highly interrelated (Gorgievski & Hobfoll, 2008).

Using Confirmatory Factor Analysis (CFA) in LISREL (version 9.1), the internal and convergent validity of the study's constructs was verified by calculating the composite reliabilities, percentages of average variance extracted and communalities (Hair et al., 2010). The composite reliabilities for all the constructs exceed the recommended value of .80 (Hair et al., 2010), and the percentages of average variance extracted all exceed 50%. With the exception of a few items in both the workplace stress

and burnout scales, the communalities (or the squared factor loadings) are all above .50 (Hair et al., 2010). According to Hair et al. (2010), when sample sizes are large, like the one in this study, a few weak communalities are acceptable. These findings support the convergent validity of the study's constructs.

The hypotheses that predicted mediating relationships were tested in SEM using a conventional two-step approach: 1) the development of measurement models and 2) the use of those models in the estimation of structural models (Hair et al., 2010). Measurement models were developed, in accordance with the guidelines of Hair et al. (2010) and Joresborg and Sorbom (1993), to examine how well the unobserved latent variables (such as workplace stress, burnout and employee engagement) were reflected by the observed or measured items from the survey instruments. In order to evaluate the acceptability of the specified measurement models, a number of fit indices and their recommended values (Table 15) were utilized to evaluate model goodness-of-fit (Hair et al., 2010).

Table 15. Model Fit Indices and Acceptable Goodness-Of-Fit Values (Hair et al. (1999)

Model Fit Index	Goodness-of-Fit Values
Chi-Square (χ^2)	Non-significant p-values
Non-normed Fit Index (NNFI)	Above .92
Comparative Fit Index (CFI)	Above .92
Root Mean Square Error of Approximation (RMSEA)	Lower than .07
Standardized Root Mean Square Residual (SRMR)	Equal to or lower than .08

Additionally, the "combinational rules" (p. 27) suggested by Hu and Bentler (1999), which identify pairs of fit indices (Table 16) that generally result in the fewest number of Type I and Type II errors, were utilized to evaluate model acceptability.

Table 16. Combinational Rules for SEM Fit Indices (Hu & Bentler, 1999)

Fit Index Combinations for Acceptable Model Fit
Non-Normed Fit Index (NNFI) of .96 or higher **and** Standardized Root Mean Square Residual (SRMR) of .09 or lower
Root Mean Square Error of Approximation (RMSEA) of .06 or lower **and** Standardized Root Mean Square Residual (SRMR) of .09 or lower
Comparative Fit Index (CFI) of .96 or higher **and** Standardized Root Mean Square Residual (SRMR) of .09 or lower

Four measurement models were developed and their fit indices are as follows (Note that the measurement models as drawn by LISREL are included in Appendix K):

- Workplace stress, burnout and employee engagement as measured by the Rich overall scale [$\chi^2(148)=770.91$; NNFI=.95; CFI=.96; RMSEA=.09; SRMR=.07]
- Workplace stress, burnout and employee engagement as measured by the ISA overall scale [$\chi^2(147)=743.69$; NNFI=.96; CFI=.96; RMSEA=.09; SRMR=.08]
- Workplace stress, burnout and employee engagement as measured by the Rich subscales [$\chi^2(517)=1797.48$; NNFI=.96; CFI=.97; RMSEA=.07; SRMR=.07]
- Workplace stress, burnout and employee engagement a measured by the ISA subscales [$\chi^2(265)=1010.65$; NNFI=.96; CFI=.97; RMSEA=.08; SRMR=.06]

In specifying these models, the 22 observed items that reflect the latent variable of workplace stress were parceled into six groups by computing the means of the items within each of the scale's six theoretically derived subscales (Mahmood et al., 2010). Similarly, in the first two models where employee engagement is reflected by a single

latent variable, the 22 observed items tied to the Rich overall engagement scale and the 9 observed items tied to the ISA overall engagement scale were parceled into the three groups that represented each scale's theoretically derived subscales (Rich et al., 2010; Soane et al., 2012). The merits of parceling and situations in which parceling is appropriate are outlined as follows in a well-cited paper by Little, Cunningham, Shahar, and Widaman (2002):

- When a construct is multidimensional (as with workplace stress and the two overall measures of employee engagement), parceling (by averaging the items) at the subscale level is appropriate unless the research is specifically concerned with the individuals items and the way they load on a particular construct;
- When constructs are measured by scales with numerous items (as with the workplace stress and Rich overall scales), the opportunity for false correlations (or Type I errors) is more likely;
- Individual items typically have inherently poor psychometric characteristics and thus can lead to models that are either unstable, exhibit large standard errors and/or yield poor model fit; and,
- Parceled data can result in more parsimonious models as fewer estimated parameters are present in comparison to item-level models.

In the initial specification of the measurement model with the Rich overall scale, the fit indices fell outside the recommended values and combinations [$\chi^2(149)=990.81$; NNFI=.94; CFI=.95; RMSEA=.11; SRMR=.12]. An examination of the recommended

modifications (Hair et al., 2010; Schumacker & Lomax, 2010) suggested an error covariance between the "Physical" and "Cognit" items as these two items had the highest correlation within the Rich overall scale (*r*=.23). Indeed, in comparison to the initial model, the chi-square in the modified model was significantly reduced to 770.91(148) [$\Delta\chi^2$ =219.90(1)] (Hair et al., 2010). Additionally, all of the fit indices improved from those of the initial model.

Similarly, in the initial specification of the measurement model with the ISA overall scale, the fit indices fell outside the recommended values and combinations [χ^2(149)=866.37; NNFI=.95; CFI=.95; RMSEA=.10; SRMR=.08]. As described above, two suggested modifications were added: an error covariance between "BMS03" and "BMS05" from the burnout scale (*r*=1.72) and an error covariance between "BMS01" from the burnout scale and the "Demands" item from the workplace stress scale (*r*=.56) (Schumacker & Lomax, 2010). In comparison to the initial model, the chi-square in the modified model was significantly reduced to 743.69(147) [$\Delta\chi^2$ =122.68(2)] (Hair et al., 2010). Also, the fit indices improved from those of the initial model. Given these results, the modified models for both the Rich overall and ISA overall scales were utilized in all subsequent analyses. Of note, the inclusion of modifications represents a limitation of this study, but it is not, by itself, a reason to reject these two measurement models (Hair et al., 2010). Neither of the measurement models with the subscale items required any modifications.

In all four measurement models, the chi-square estimates are significant (Tables 17-20). Although this finding does not typically support the acceptability of the models,

this statistic is highly sensitive to large sample sizes and thus needs to be analyzed in combination with other fit indices (Hair et al., 2010; Hu & Bentler, 1999). Indeed, the combination of fit indices recommended by Hu and Bentler (1999) indicate that the data fit all four measurement models well. Further, the standardized factor loadings for each model (Appendix K) are all statistically significant with *t*-values exceeding |1.96| (Hair et al., 2010).

Using CFA, the discriminant validity of the constructs was confirmed in each measurement model by comparing each hypothesized model to two alternative models (Schumacker & Lomax, 2010). The first alternative model combined the items of workplace stress and burnout into one factor (or latent variable) in consideration of the high interrelations between those two constructs (Gorgievski & Hobfoll, 2008). The second alternative model combined all of the items from all of the constructs into a single factor. As shown in Tables 17-20, the hypothesized measurement models all evidence better fit indices than their alternative models, and the chi-square differences between the measurement models and each of their alternative models are all significant. These results support the discriminant or construct validity for each measurement model (Schumacker & Lomax, 2010).

Table 17. Results of Confirmatory Factor Analysis (CFA) with Rich Overall Scale (n=472)

Fit Indices	***df***	χ^2	$\Delta\chi^2$ ***(df)***	***NNFI***	***CFI***	***RMSEA***	***SRMR***
Measurement Model[a]	148	770.91*		0.95	0.96	0.09	0.07
Alternative Model 1[b]	150	1169.52*	398.61(2)*	0.92	0.93	0.12	0.08
Alternative Model 2[c]	151	1358.04*	587.13(3)*	0.91	0.92	0.13	0.09

[a]Hypothesized model includes Rich overall engagement, workplace stress and burnout.

[b]Alternative model 1 loads on 2 factors: Rich overall engagement and the combined items of workplace stress and burnout.

[c]Alternative model 2 loads all items on a single factor.

*p<.001

Table 18. Results of Confirmatory Factor Analysis (CFA) with ISA Overall Scale (n=472)

Fit Indices	***df***	χ^2	$\Delta\chi^2$ ***(df)***	***NNFI***	***CFI***	***RMSEA***	***SRMR***
Measurement Model[a]	147	743.69*		0.96	0.96	0.09	0.08
Alternative Model 1[b]	149	1146.18*	402.49(2)*	0.93	0.94	0.12	0.09
Alternative Model 2[c]	150	1279.85*	536.16(3)*	0.92	0.93	0.13	0.08

[a]Hypothesized model includes ISA overall engagement, workplace stress and burnout.

[b]Alternative model 1 loads on 2 factors: ISA overall engagement and the combined items of workplace stress and burnout.

[c]Alternative model 2 loads all items on a single factor.

*p<.001

Table 19. Results of Confirmatory Factor Analysis (CFA) with Rich Subscales (n=472)

Fit Indices	*df*	χ^2	$\Delta\chi^2$ *(df)*	*NNFI*	*CFI*	*RMSEA*	*SRMR*
Measurement Model[a]	517	1797.48*		0.96	0.97	0.07	0.07
Alternative Model 1[b]	521	2198.10*	400.62(4)*	0.95	0.96	0.08	0.08
Alternative Model 2[c]	527	7271.95*	5474.47(10)*	0.81	0.82	0.16	0.20

[a]Hypothesized model includes physical engagement, emotional engagement, cognitive engagement, workplace stress and burnout.

[b]Alternative model 1 loads on 4 factors: physical engagement, emotional engagement, cognitive engagement and the combined items of workplace stress and burnout.

[c]Alternative model 2 loads all items on a single factor.

*p<.001

Table 20. Results of Confirmatory Factor Analysis (CFA) with ISA Subscales (n=472)

Fit Indices	*df*	χ^2	$\Delta\chi^2$ *(df)*	*NNFI*	*CFI*	*RMSEA*	*SRMR*
Measurement Model[a]	265	1010.65*		0.96	0.97	0.08	0.06
Alternative Model 1[b]	269	1442.81*	432.16(4)*	0.94	0.95	0.10	0.08
Alternative Model 2[c]	275	4543.50*	3532.85(10)*	0.80	0.81	0.18	0.14

[a]Hypothesized model includes intellectual engagement, social engagement, affective engagement, workplace stress and . burnout

[b]Alternative model 1 loads on 4 factors: intellectual engagement, social engagement, affective engagement and the combined items of workplace stress and burnout.

[c]Alternative model 2 loads all items on a single factor.

*p<.001

A number of tests were conducted in order to rule out the possibility of bias due to common method variance. First, the Harmon single-factor test was utilized to assess the possibility of common method variance by constraining the number of factors in an exploratory factor analysis (EFA) to one and then examining the unrotated solution. In the analysis with the items from the workplace stress, burnout and Rich scales, 8 out of 50 items have Eigenvalues greater than one which accounts for 66.11% of the variance,

and one item accounts for 30.09%. In the EFA with the items from the workplace stress, burnout and ISA scales, 7 out of 41 items have Eigenvalues greater than one which accounts for 66.15% of the variance, and one factor accounts for 34.83% of the variance (Podsakoff et al., 2003). As no single factor accounts for the majority of the variance in any measurement model, the Harmon test suggests that the risk of bias from common method variance is low.

Next, an additional test for common method variance, the common latent factor test, was run using CFA. In this test, another latent variable or factor was added to each measurement model and paths were added from this new "common" latent factor to all of the observed items in the model (Podsakoff et al., 2003). The factor loadings from the models with the common latent factor were compared to those from the models without it. The differences in the factor loadings between the measurement models with and without the common latent factor are less than .20, affirming the low risk of bias from common method variance (Podsakoff et al., 2003).

In addition to the above statistical tests for common method variance, the study employed a number of suggested procedural recommendations from Podsakoff et al. (2003) which serve to reduce this risk. These include the use of scales that were validated in previous studies, the intentional ordering of survey questions to capture the dependent variables first, the proximal separation of items in the survey instrument by using different Likert scales for different survey questions, and the use of simple, clear and concise survey questions (Podsakoff et al., 2003). Finally, the risk of bias due to social desirability was reduced by following the recommendations of Tsai and Ghoshal

(1998) which guaranteed survey respondents 1) complete confidentiality; 2) that their responses were stored in an independent location away from their organizations; and, 3) that all analyses would be performed and reported at aggregated levels.

The intent of the study was not to examine the between-organizational effects of the variables. However, in order to control for the possibility of bias due to multi-level effects from survey participants who were nested in different hospital organizations, interclass correlation coefficients (ICC1 and ICC2) were calculated for each construct under examination and for each hospital or hospital system that participated in the study (McGraw & Wong, 1996). The coefficients, a measure of interrater reliability, calculate the proportion of the variance that is attributable to the survey respondents themselves (Table 21). The calculated ICCs for the participating organizations in this study are all non-significant, indicating that the potential for inter-organizational bias is not likely (Landers, 2011; Shrout & Fleiss, 1979).

Table 21. Average Measures Interclass Correlation Coefficients

	ICC1	***ICC2***
Workplace Stress	.203*	.310*
Burnout	.239*	.218*
Physical Engagement	.051*	.141*
Emotional Engagement	.182*	.146*
Cognitive Engagement	.022*	.095*
Overall Rich Engagement	.082*	.103*
Intellectual Engagement	.126*	.177*
Social Engagement	.311*	.322*
Affective Engagement	.032*	.011*
Overall ISA Engagement	.335*	.126*

*p>.05

Analysis of Hypothesized Relationships

Hypotheses H_{1a} and H_{1b} predicted that workplace stress would be negatively related to employee engagement as measured by the Rich Scale and as measured by the ISA Scale, respectively. These relationships were tested using correlation analysis (Table 13 and Table 14) (J. Cohen et al., 2003). The correlation between workplace stress and Rich overall engagement is significant at -.28 ($p<.01$), and the correlation between workplace stress and ISA overall engagement is significant at -.49 ($p<.01$). Thus, hypotheses H_{1a} and H_{1b} are supported.

Hypothesis H_2 predicted that the negative relationship between workplace stress and employee engagement would be stronger when engagement was measured by the Rich Scale than when measured by the ISA Scale. As described above, the negative correlation with workplace stress and engagement is smaller with the Rich Scale than it is with the ISA Scale. Although hypothesis H_2 is not supported, this hypothesis also suggests that there is significant difference in these relationships. To test this, Fisher's *r* to *z* calculation was utilized which confirms that the relationships between workplace stress and the two overall measures of employee engagement are significantly different ($z=3.804$, $p<.001$) (Kristopher J Preacher, 2002). Also, although not specifically hypothesized, Fisher's *r* to *z* calculation confirms that the relationships between the construct of burnout and the two overall measures of employee engagement are significantly different ($z=3.1$, $p<.01$).

The next set of hypotheses predicted certain relationships among the proposed constructs of workplace stress, burnout and employee engagement (as measured by the

Rich and ISA scales at both the overall and subscale levels). Each of these will be discussed in detail in the following sections, but in summary, hypotheses H_{3a} and H_{3b} predicted that burnout would mediate the negative relationship between workplace stress and employee engagement as measured by the Rich overall scale and ISA overall scale, respectively. Hypotheses H_{4a}-H_{4c} predicted that burnout would mediate the relationships between workplace stress and each of the Rich Scale's subscales, and hypotheses H_{5a}-H_{5c} predicted that burnout would mediate the relationships between workplace stress and each of ISA Scale's subscales. A number of statistical tests were used to examine these relationships including multiple hierarchical regression using SPSS, maximum likelihood structural equation modeling (SEM) using LISREL and bootstrapping using the INDIRECT macro for SPSS developed by K. J. Preacher and Hayes (2004).

The structural models presented below were developed, compared and analyzed in order to identify statistically significant differences in the underlying nomological frameworks (Hair et al., 2010). Additionally, tests for the indirect effects of mediation by the construct of burnout on the relationships between workplace stress and employee engagement were conducted in accordance with the guidelines of Hair et al. (2010). This SEM-based multi-step approach is as follows:

1. Confirm the statistical significance of the following correlations (if any of these relationships are not significant, then mediation does not exist):
    a. The direct relationship between the independent variable (workplace stress) and the outcome (employee engagement);

b. The relationship the independent variable (workplace stress) and the mediator (burnout); and
c. The relationship between the mediator (burnout) and the outcome (employee engagement).

2. Develop a base model with only the direct relationship between the independent variable (workplace stress) and the outcome (employee engagement).
3. Develop a full model by adding the mediator (burnout) and by adding the additional paths between the mediator (burnout) and the independent variable (workplace stress) and between the mediator (burnout) and the outcome (employee engagement).
4. Compare the two models as follows:
    a. If the relationship between the independent variable (workplace stress) and the outcome (employee engagement) remains significant and unchanged once the mediator (burnout) is added, then mediation is not supported.
    b. If the relationship between the independent variable (workplace stress) and the outcome (employee engagement) remains significant but is reduced once the mediator (burnout) is added, then partial mediation is supported.
    c. If the relationship between the independent variable (workplace stress) and the outcome (employee engagement) becomes non-significant

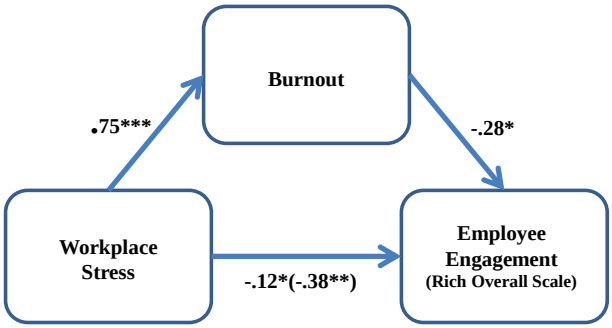
once the mediator (burnout) is added, then complete mediation is supported.

In order to rule out alternative explanations for the relationships between workplace stress, burnout and the various measures of employee engagement, the full structural models were modified to include additional latent factors representing the control variables of gender, age, supervisory status and EHR. In the models in which employee engagement was measured by the Rich overall scale and the Rich subscales, the control variables had no effect on the relationships. Similarly, the control variables had no effect on the relationships in the model in which employee engagement was measured by the ISA overall scale. In the model in which engagement was measured by the ISA subscales, the control variables of age and EHR appeared to impact the relationship between workplace stress and intellectual engagement, rendering it non-significant.

To further analyze this finding, all of the hypothesized relationships were tested again using multiple hierarchical regression in SPSS and compared to the same tests that included the control variables of gender, age, supervisory status and EHR. In these tests, none of the control variables had any effect on any of the direct relationships or on any of the mediating ones. Therefore, it is likely that the control variables have no impact on any of the hypothesized relationships (J. Cohen et al., 2003). For the purposes of parsimony, the models and their fit indices are reported without the control variables (Hair et al., 2010).

Workplace Stress, Burnout and Employee Engagement (Rich Overall Scale)

Hypothesis H_{3a} predicted that burnout would fully mediate the negative relationship between workplace stress and employee engagement as measured by the Rich Scale. A structural model was developed that represents this hypothesized relationship (Figure 10; Note that the full structural model as drawn by LISREL is included in Appendix L). In accordance with the previously described guidelines of Hair et al. (2010), this model was compared to a base model that excluded the construct of burnout.



Notes: Standardized path coefficients (SPC) are depicted.
SPC in parentheses represents the coefficient from the base model.

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

Figure 10. Mediation Model with Rich Overall Scale

The recommended combination of fit indices indicate that the data fit the full structural model well [$\chi^2(148)=770.91$; NNFI=.95; CFI=.96; RMSEA=.09; SRMR=.07] (Hu & Bentler, 1999). As shown in Table 22, the fit indices for the full model are slightly better than those for the base model, and the chi-square difference is significant [$\Delta\chi^2 =56.26(1)$]. All of the paths depicted in Figure 10 are significant with *t*-values

exceeding |1.96| (Hair et al., 2010). The standardized path coefficients (SPC) confirm the strong, positive relationship between workplace stress and burnout (SPC=.75, *t*=8.65, p<.001) and the weaker, but significant, negative relationships between workplace stress and Rich overall engagement (SPC=-.12, *t*=-2.07, p<.05) and between burnout and Rich overall engagement (SPC=-.28, *t*=-2.54, p<.05). Finally, as shown in Figure 10, the SPC between workplace stress and Rich overall engagement is still significant in the full model although it is smaller than it is in the base model (SPC=-.38, *t*=-2.78, p<.01). These are indications of partial mediation by burnout on the relationship between workplace stress and Rich overall engagement.

Table 22. Model Comparison with Rich Overall Scale (n=472)

Fit Indices	***df***	χ^2	$\Delta\chi^2$***(df)***	***NNFI***	***CFI***	***RMSEA***	***SRMR***
Base Model[a]	149	827.17*		0.95	0.96	0.10	0.07
Full Model[b]	148	770.91*	56.26(1)*	0.95	0.96	0.09	0.07

[a]Base model includes Rich overall engagement and workplace stress.
[b]Full model includes Rich overall engagement, workplace stress and burnout.
*p<.001

To further understand the magnitude of this mediating relationship, an analysis of the direct and indirect effects was conducted (Hair et al., 2010). As shown in Table 23, the direct effect of the relationship between workplace stress and Rich overall engagement is -.12. However, the indirect effect of that same relationship through the mediator of burnout (computed by multiplying the SPC between workplace stress and

burnout with the SPC between burnout and Rich overall engagement) increases the total effect to -.32.

Table 23. Decomposition of Effects of Full Model and Rich Overall Scale

		Standardized Path Coefficient (*t*-value)		
Path		***Direct Effect***	***Indirect Effect***	***Total Effect***
Workplace Stress	→ Burnout	0.75 (8.65)**	–	0.75
	→ Employee Engagement	-0.12(-2.07)*	-0.21	-0.32
Burnout	→ Employee Engagement	-0.28(-2.54)*	–	-0.28

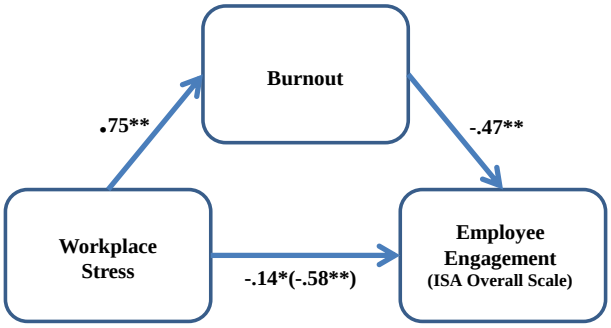
*p<.05 **p<.001

To test the significance of the mediating relationship and resultant indirect effect, bootstrapping analysis was conducted with the macro developed by K. J. Preacher and Hayes (2004). The 95% confidence interval of the indirect effect was obtained with 5,000 bootstrap samples (CI=-.20; -.06). The relationships in this analysis are all significant, and the range between the lower and upper bounds of the confidence intervals does not include zero (MacKinnon, Lockwood, & Williams, 2004; Kristopher J Preacher & Hayes, 2008). These results confirm that burnout partially mediates the relationship between workplace stress and employee engagement as measured by the Rich Scale (Hair et al., 2010). As such, hypothesis H_{3a} is partially supported.

Workplace Stress, Burnout and Employee Engagement (ISA Overall Scale)

Hypothesis H_{3b} predicted that burnout would partially mediate the negative relationship between workplace stress and employee engagement as measured by the ISA Scale. A structural model was developed that represents this hypothesized relationship (Figure 11; Note that the full structural model as drawn by LISREL is included in

Appendix L). In accordance with the previously described guidelines of Hair et al. (2010), this model was compared to a base model that excluded the construct of burnout.



Notes: Standardized path coefficients (SPC) are depicted.
SPC in parentheses represents the coefficient from the base model.

***p<.05 **p<.001**

Figure 11. Mediation Model with ISA Overall Scale

The recommended combination of fit indices indicate that the data fit the full structural model well [$\chi^2(147)=743.69$; NNFI=.96; CFI=.96; RMSEA=.09; SRMR=.08] (Hu & Bentler, 1999). As shown in Table 24, the fit indices for the full model are slightly better than those for the base model, and the chi-square difference is significant [$\Delta\chi^2 =43.88(1)$]. All of the paths depicted in Figure 11 are significant with *t*-values exceeding |1.96| (Hair et al., 2010). SPCs confirm the strong, positive relationship between workplace stress and burnout (SPC=.75, t=9.84, p<.001), the weaker, but significant, negative relationship between workplace stress and ISA overall engagement (SPC=-.14, t=-2.00, p<.05) and the strong, negative relationship between burnout and ISA overall engagement (SPC=-.47, t=-5.18, p<.001). Finally, as shown in Figure 11, the SPC between workplace stress and ISA overall engagement is still significant in the full model although it is smaller than it is in the base model (SPC=-.58, t=-7.05, p<.001).

These are indications of partial mediation by burnout on the relationship between workplace stress and ISA overall engagement (Hair et al., 2010).

Table 24. Model Comparison with ISA Overall Scale (n=472)

Fit Indices	***df***	χ^2	$\Delta\chi^2(df)$	***NNFI***	***CFI***	***RMSEA***	***SRMR***
Base Model[a]	148	787.57*		0.95	0.96	0.10	0.08
Full Model[b]	147	743.69*	43.88(1)*	0.96	0.96	0.09	0.08

[a]Base model includes ISA overall engagement and workplace stress.
[b]Full model includes ISA overall engagement, workplace stress and burnout.
*p<.001

To further understand the magnitude of this mediating relationship, an analysis of the direct and indirect effects was conducted (Hair et al., 2010). As shown in Table 25, the direct effect of the relationship between workplace stress and ISA overall engagement is -.14. However, the indirect effect of that same relationship through the mediator of burnout increases the total effect to -.49.

Table 25. Decomposition of Effects of Full Model and ISA Overall Scale

		Standardized Path Coefficient (*t*-value)		
Path		***Direct Effect***	***Indirect Effect***	***Total Effect***
Workplace Stress	→ Burnout	0.75 (9.84)**	–	0.75
	→ Employee Engagement	-0.14 (-2.00)*	-0.35	-0.49
Burnout	→ Employee Engagement	-0.47 (-5.18)**	–	-0.47

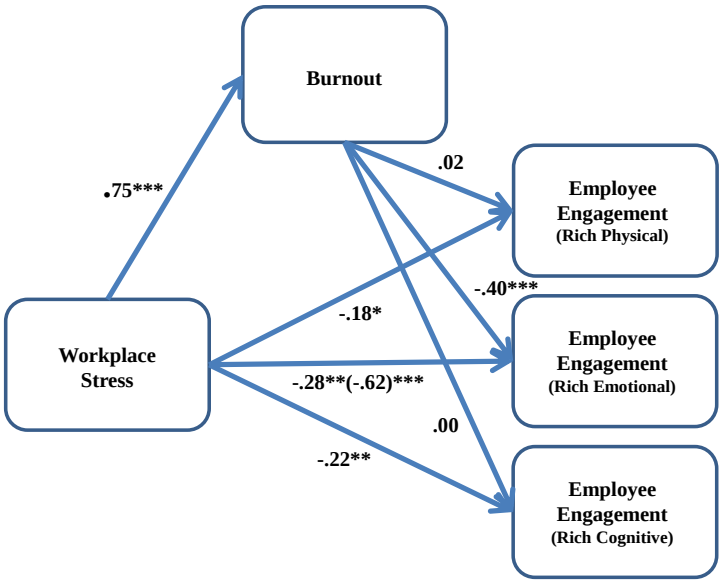
*p<.05 **p<.001

To test the significance of the mediating relationship and resultant indirect effect, bootstrapping analysis was used in accordance with K. J. Preacher and Hayes (2004).

The 95% confidence interval of the indirect effect was obtained with 5,000 bootstrap samples (CI=-.36; -.14). The relationships in this analysis are all significant, and the range between the lower and upper bounds of the confidence intervals does not include zero (MacKinnon et al., 2004; Kristopher J Preacher & Hayes, 2008). These results confirm that burnout partially mediates the relationship between workplace stress and employee engagement as measured by the ISA Scale. Thus, hypothesis H_{3b} is supported.

Workplace Stress, Burnout and Employee Engagement (Rich Subscales)

Hypotheses H_{4a}, H_{4b} and H_{4c} predicted that burnout would fully mediate the negative relationships between workplace stress and each of the three Rich subscales: physical, emotional and cognitive engagement. A structural model was developed that simultaneously represents these hypothesized relationships (Figure 12; Note that the full structural model as drawn by LISREL is included in Appendix L). In accordance with the previously described guidelines of Hair et al. (2010), this model was compared to a base model that excluded the construct of burnout.



Notes: Standardized path coefficients (SPC) are depicted.
SPC in parentheses represents the coefficient from the base model.

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

Figure 12. Mediation Model with Rich Subscales

The fit indices indicate that the data fit the full structural model fairly well [$\chi^2(520)=2308.17$; NNFI=.95; CFI=.95; RMSEA=.09; SRMR=.17] (Hair et al., 2010). Although the fit indices for the full model shown in Table 26 are not improved over those for the base model, the chi-square is smaller with the full model and the chi-square difference between the two models is significant [$\Delta\chi^2 =36.13(3)$]. This suggests that the full model fairly estimates the hypothesized relationships (Hair et al., 2010).

Table 26. Model Comparison with Rich Subscales (n=472)

Fit Indices	*df*	χ^2	$\Delta\chi^2(df)$	*NNFI*	*CFI*	*RMSEA*	*SRMR*
Base Model[a]	523	2344.33*		0.95	0.95	0.09	0.17
Full Model[b]	520	2308.17*	36.16(3)*	0.95	0.95	0.09	0.17

[a]Base model includes physical engagement, emotional engagement, cognitive engagement and workplace stress.

[b]Full model includes physical engagement, emotional engagement, cogntive engagement, workplace stress and burnout.

*p<.001

The findings from the analysis of the hypothesized relationships with each Rich subscale are presented as follows:

Starting with physical engagement, the SPCs depicted in Figure 12 confirm the strong, positive and significant relationship between workplace stress and burnout (SPC=.75; *t*=8.49, p<.001) and the weak, but significant, negative relationship between workplace stress and physical engagement (SPC=-.18, *t*=-2.12, p<.05). However, the SPC between burnout and physical engagement is non-significant (SPC=.02, *t*=.18, p=.85) and therefore, there is no mediating effect by burnout on the negative relationship between workplace stress and physical engagement as measured by the Rich physical subscale (Hair et al., 2010). Hypothesis H_{4a} is not supported.

Turning to emotional engagement, the SPCs in Figure 12 confirm the strong, positive and significant relationship between workplace stress and burnout (SPC=.75, *t*=8.49, p<.001), the weaker, but significant, negative relationship between workplace stress and emotional engagement (SPC=-.28, *t*=-4.01, p<.001) and the strong, negative relationship between burnout and emotional engagement (SPC=-.40, *t*=-5.60, p<.001).

Finally, as shown in Figure 12, the SPC between workplace stress and emotional engagement is still significant in the full model although it is smaller than it is in the base model (SPC=-.62, *t*=-9.61, p<.001). These are indications of partial mediation by burnout on the relationship between workplace stress and emotional engagement (Hair et al., 2010).

To further understand the magnitude of this mediating relationship, an analysis of the direct and indirect effects was conducted (Hair et al., 2010). As shown in Table 27, the direct effect of the relationship between workplace stress and emotional engagement is -.28. However, the indirect effect of that same relationship through the mediator of burnout increases the total effect to -.58.

Table 27. Decomposition of Effects with Full Model and Rich Emotional Subscale

		Standardized Path Coefficient (*t*-value)		
Path		***Direct Effect***	***Indirect Effect***	***Total Effect***
Workplace Stress	→ Burnout	0.75 (8.49)*	–	0.75
	→ Employee Engagement	-0.28(-4.01)*	-0.30	-0.58
Burnout	→ Employee Engagement	-0.40(-5.60)*	–	-0.40

*p<.001

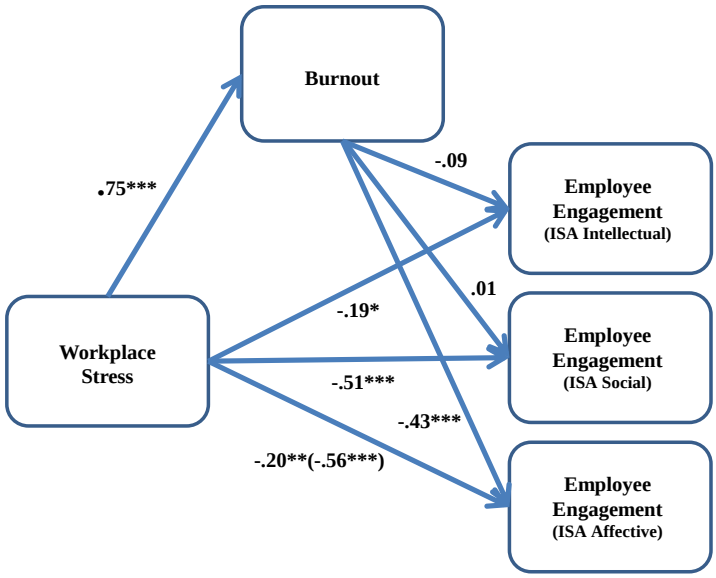
To test the significance of the mediating relationship and resultant indirect effect, bootstrapping analysis was used in accordance with K. J. Preacher and Hayes (2004). The 95% confidence interval of the indirect effect was obtained with 5,000 bootstrap samples (CI=-.42; -.24). The relationships in this analysis are all significant, and the range between the lower and upper bounds of the confidence intervals does not include zero (MacKinnon et al., 2004; Kristopher J Preacher & Hayes, 2008). These results

confirm that burnout partially mediates the negative relationship between workplace stress and emotional engagement as measured by the Rich emotional subscale. As such, hypothesis H_{4b} is partially supported.

Concluding with cognitive engagement, the SPCs depicted in Figure 12 confirm the strong, positive and significant relationship between workplace stress and burnout (SPC=.75, t=8.49, p<.001) and the weaker, but significant, negative relationship between workplace stress and cognitive engagement (SPC=-.22, t=-2.62, p<.01). However, the SPC between burnout and cognitive engagement is non-significant (SPC=.00, t=-.05, p=.96) and therefore, there is no mediating effect by burnout on the negative relationship between workplace stress and cognitive engagement as measured by the Rich cognitive subscale (Hair et al., 2010). Hypothesis H_{4c} is not supported.

Workplace Stress, Burnout and Employee Engagement (ISA Subscales)

Hypotheses H_{5a} and H_{5c} predicted that burnout would fully mediate the negative relationships between workplace stress and two of the three ISA subscales: intellectual and affective engagement. Hypothesis H_{5b} predicted that burnout would partially mediate the negative relationship between workplace stress and the third ISA subscale: social engagement. A structural model that simultaneously represents these hypothesized relationships was developed (Figure 13; Note that the full structural model as drawn by LISREL is included in Appendix L). In accordance with the previously described guidelines of Hair et al. (2010), this model was compared to a base model that excluded the construct of burnout.



Notes: Standardized path coefficients (SPC) are depicted.
SPC in parentheses represents the coefficient from the base model.

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

Figure 13. Mediation Model with ISA Subscales

The recommended combination of fit indices indicate that the data fit the full structural model well [$\chi^2(268)=1182.72$; NNFI=.96; CFI=.96; RMSEA=.09; SRMR=.09] (Hu & Bentler, 1999). As shown in Table 28, the fit indices for the full model are slightly better than those for the base model, and the chi-square difference between the two models is significant [$\Delta\chi^2 =35.89(3)$]. This suggests that the full model fairly estimates the hypothesized relationships (Hair et al., 2010).

Table 28. Model Comparison with ISA Subscales (n=472)

Fit Indices	*df*	χ^2	$\Delta\chi^2(df)$	*NNFI*	*CFI*	*RMSEA*	*SRMR*
Base Model[a]	271	1218.61*		0.95	0.96	0.09	0.09
Full Model[b]	268	1182.72*	35.89(3)*	0.96	0.96	0.09	0.09

[a]Base model includes intellectual engagement, social engagement, affective engagement and workplace stress.

[b]Full model includes intellectual engagement, social engagement, affective engagement, workplace stress and burnout.

*p<.001

The findings from the analysis of the hypothesized relationships with each ISA subscale are presented as follows:

Starting with intellectual engagement, the SPCs depicted in Figure 13 confirm the strong, positive and significant relationship between workplace stress and burnout (SPC=.75; *t*=8.51, p<.001) and the weak, but significant, negative relationship between workplace stress and intellectual engagement (SPC=-.19, *t*=-2.28, p<.05). However, the SPC between burnout and intellectual engagement is non-significant (SPC=-.09, *t*=-1.12, p=.26) and therefore, there is no mediating effect by burnout on the negative relationship between workplace stress and intellectual engagement as measured by the ISA intellectual subscale (Hair et al., 2010). Hypothesis H_{5a} is not supported.

Turning to social engagement, the SPCs depicted in Figure 13 confirm the strong, positive and significant relationship between workplace stress and burnout (SPC=.75; *t*=8.51, p<.001) and the strong, significant negative relationship between workplace stress and social engagement (SPC=-.51, *t*=-6.06, p<.001). However, the SPC between burnout and social engagement is non-significant (SPC=.01, *t*=.16, p=.87) and therefore, there is

no mediating effect by burnout on the negative relationship between workplace stress and social engagement as measured by the ISA social subscale (Hair et al., 2010). Hypothesis H_{5b} is not supported.

Concluding with affective engagement, the SPCs in Figure 13 confirm the strong, positive and significant relationship between workplace stress and burnout (SPC=.75, t=8.51, p<.001), the weaker, but significant, negative relationship between workplace stress and affective engagement (SPC=-.20, t=-2.82, p<.01) and the strong, negative relationship between burnout and affective engagement (SPC=-.43, t=-5.61, p<.001). Finally, as shown in Figure 13, the SPC between workplace stress and affective engagement is still significant in the full model although it is smaller than it is in the base model (SPC=-.56, t=-8.87, p<.001). These are indications of partial mediation by burnout on the relationship between workplace stress and affective engagement (Hair et al., 2010).

To further understand the magnitude of this mediating relationship, an analysis of the direct and indirect effects was conducted (Hair et al., 2010). As shown in Table 29, the direct effect of the relationship between workplace stress and emotional engagement is -.20. However, the indirect effect of that same relationship through the mediator of burnout increases the total effect to -.52.

Table 29. Decomposition of Effects of Full Model with ISA Affective Subscale

Path			Standardized Path Coefficient (*t*-value)		
			Direct Effect	*Indirect Effect*	*Total Effect*
Workplace Stress	→	Burnout	0.75 (8.51)**	–	0.75
	→	Employee Engagement	-0.20 (-2.82)*	-0.32	-0.52
Burnout	→	Employee Engagement	-0.43 (-5.60)**	–	-0.43

*p<.01 **p<.001

To test the significance of the mediating relationship and resultant indirect effect, bootstrapping analysis was used in accordance with K. J. Preacher and Hayes (2004). The 95% confidence interval of the indirect effect was obtained with 5,000 bootstrap samples (CI=-.70; -.38). The relationships in this analysis are all significant, and the range between the lower and upper bounds of the confidence intervals does not include zero (MacKinnon et al., 2004; Kristopher J Preacher & Hayes, 2008). These results confirm that burnout partially mediates the relationship between workplace stress and affective engagement as measured by the ISA affective subscale. As such, hypothesis H_{5c} is partially supported.

Summary of the Chapter

This chapter presented the results from the analysis of the data collected in this study. A discussion of the demographics associated with the participating hospitals and IT professionals was presented first. Next, the assumptions foundational to multivariate analysis were supported including the normal distribution of data, homoscedasticity, absence of multicollinearity, independence of errors and independence of variables. The descriptive statistics of the study's constructs including the means, standard deviations, scale reliabilities and zero-order correlation coefficients were detailed. The internal and

convergent validity and the discriminant validity of the constructs were also supported. Two different statistical tests supported the low likelihood of bias due to common method variance, and non-significant interclass correlation coefficients suggested that risk of bias from multi-level effect was also low. Finally, the analyses of the hypothesized relationships including the direct and indirect (or mediating) effects were presented. This analysis is summarized in Table 30.

Table 30. Summary of Hypothesized Relationships

#	Hypothesis	Result
H_{1a}	Workplace stress is negatively related to employee engagement as measured by the Rich Scale	Supported
H_{1b}	Workplace stress is negatively related to employee engagement as measured by the ISA Scale	Supported
H_2	The negative relationship between workplace stress and employee engagement is stronger when engagement is measured by the Rich Scale than when it is measured by the ISA Scale	Not Supported
H_{3a}	Burnout fully mediates the negative relationship between workplace stress and employee engagement as measured by the Rich Scale	Partially Supported
H_{3b}	Burnout partially mediates the negative relationship between workplace stress and employee engagement as measured by the ISA Scale	Supported
H_{4a}	Burnout fully mediates the negative relationship between workplace stress and physical employee engagement as measured by the Rich subscale	Not Supported
H_{4b}	Burnout fully mediates the negative relationship between workplace stress and emotional employee engagement as measured by the Rich subscale	Partially Supported
H_{4c}	Burnout fully mediates the negative relationship between workplace stress and cognitive employee engagement as measured by the Rich subscale	Not Supported
H_{5a}	Burnout fully mediates the negative relationship between workplace stress and intellectual employee engagement as measured by the ISA subscale	Not Supported
H_{5b}	Burnout partially mediates the negative relationship between workplace stress and social employee engagement as measured by the ISA subscale	Not Supported
H_{5c}	Burnout fully mediates the negative relationship between workplace stress and affective employee engagement as measured by the ISA subscale	Partially Supported

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

Introduction

This chapter begins with a brief summary of the study. It then discusses the findings of the study in relation to the existing literature based upon the data analysis in Chapter 4. Conclusions and implications for theory are presented, followed by implications for practice within healthcare IT, the broader business context, and for human resource development. A number of recommendations for future research are discussed, and the chapter concludes with a summary.

Summary of the Study

The purpose of this study was to examine the relationships between workplace stress, burnout and employee engagement using two different engagement measurement instruments and to examine these relationships at the overall (i.e., all dimensions or subscales) and dimensional level of each engagement instrument. The study's hypotheses predicted negative relationships between employee engagement and workplace stress and further predicted that burnout would play a mediating role in those negative relationships. Importantly however, the hypotheses also suggested that the relationships between workplace stress, burnout and employee engagement depend, in fact, on how the construct of employee engagement is measured. This study hypothesized that even similarly conceptualized measures of employee engagement

would expose different relationships with these variables suggesting that the selection of employee engagement measurement instruments is vital both to understanding different aspects of the construct and to its operationalization in practice.

Responding to a resurgence in scholarly interest in Kahn's (1990) conceptualization, two different (but similarly conceptualized) needs-satisfaction based measurement of employee engagement were employed: the Rich Scale (Rich et al., 2010) and the ISA Scale (Soane et al., 2012). Both measures are clearly grounded in Kahn's (1990), but even a cursory examination of each measure's subscales suggest that they are not measuring the same aspects of engagement. This study examined the relationships between workplace stress and burnout on both the overall and subscale (or dimensional) components of these two instruments to understand the similarities and differences between them and to evaluate what those similarities and/or differences might suggest from both a theoretical and practical perspective. Further, by not using burnout-antithesis based measures of engagement (which are often used in engagement-related research), this study sought to address some of the tensions in the scholarly literature about the relationships between burnout and employee engagement. The specific hypotheses were as follows:

Hypothesis 1 predicted a negative relationship between workplace stress and both measures of employee engagement (Figure 14).

H_{1a}: *Workplace stress is negatively related to employee engagement as measured by the Rich Scale.*

H_{1b}: *Workplace stress is negatively related to employee engagement as measured by the ISA Scale.*

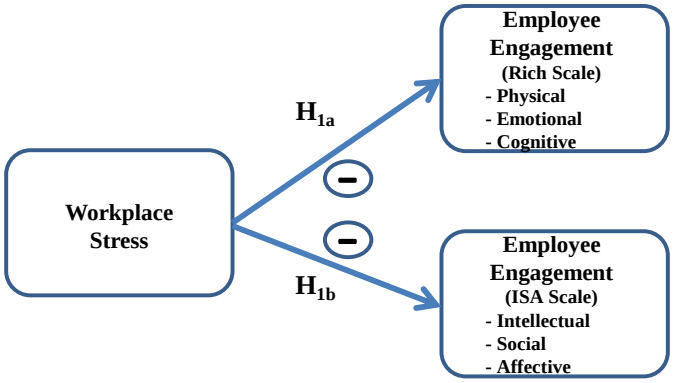


Figure 14. Conceptual Model of Hypothesized Relationships between Workplace Stress and Employee Engagement

Hypothesis 2 predicted that the relationship between workplace stress and employee engagement differs depending upon the instrument used to measure employee engagement. This hypothesis asserted that the inclusion of the social (or interpersonal relationship) component in the ISA Scale weakens the negative relationship between workplace stress and employee engagement in comparison to the same relationship measured by the Rich Scale which excludes that dimension.

H_2: *The negative relationship between workplace stress and employee engagement is stronger when employee engagement is measured by the Rich Scale than when measured by the ISA Scale.*

The next two hypotheses, H_{3a} and H_{3b}, proposed that the presence of burnout has a mediation or indirect effect on the relationship between workplace stress and employee engagement, and that the indirect effect differs depending upon the instrument used to

measure employee engagement (Figure 15). Specifically, hypothesis H_{3b} predicted that the inclusion of the social (or interpersonal relationship) component in the ISA Scale weakens the indirect effect of burnout on the negative relationship between workplace stress and employee engagement in comparison to the same relationship measured by the Rich Scale which excludes that dimension.

H_{3a}: *Burnout fully mediates the negative relationship between workplace stress and employee engagement as measured by the Rich Scale.*

H_{3b}: *Burnout partially mediates the negative relationship between workplace stress and employee engagement as measured by the ISA Scale.*

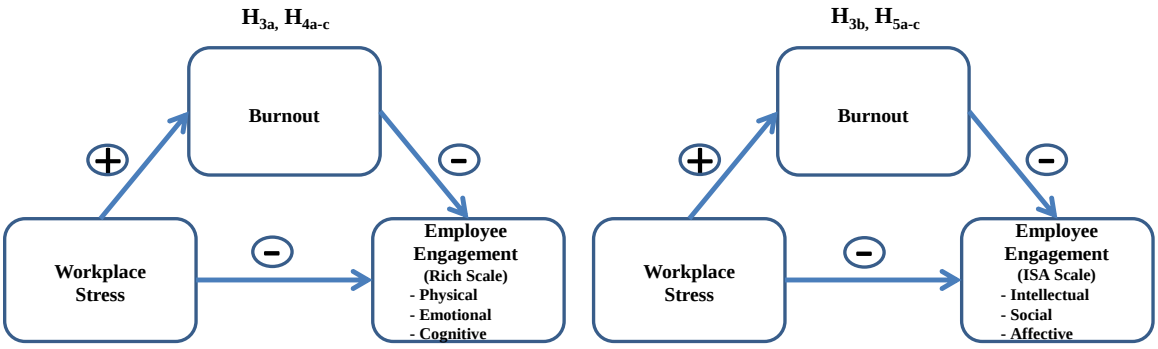


Figure 15. Conceptual Model of Hypothesized Relationships between Workplace Stress, Burnout and Different Measures of Employee Engagement

The final set of hypotheses, H_{4a}-H_{4c} and H_{5a}-H_{5c}, predicted that the differences in the relationships between workplace stress, burnout and employee engagement would be found at the sub-scale or dimensional level of the employee engagement operationalizations and related measurement instruments.

H_{4a}: *Burnout fully mediates the negative relationship between workplace stress and physical employee engagement as measured by the Rich subscale.*

H_{4b}: *Burnout fully mediates the negative relationship between workplace stress and emotional employee engagement as measured by the Rich subscale.*

H_{4c}: *Burnout fully mediates the negative relationship between workplace stress and cognitive employee engagement as measured by the Rich subscale.*

H_{5a}: *Burnout fully mediates the negative relationship between workplace stress and intellectual employee engagement as measured by the ISA subscale.*

H_{5b}: *Burnout partially mediates the negative relationship between workplace stress and social employee engagement as measured by the ISA subscale.*

H_{5c}: *Burnout fully mediates the negative relationship between workplace stress and affective employee engagement as measured by the ISA subscale.*

To address the research hypotheses, an *a priori* theory-based, quantitative survey design was used. The context for the study was the stress-charged environment of IT professionals working on electronic health record (EHR) implementations in community hospitals in the United States. This particular population was chosen because the IT professionals working to support EHR-related technologies and processes represent a fairly homogenous group across the U.S. Regardless of the hospital for which they work, they are confronted with similar technologies, clinical workflows and federally mandated objectives for implementation (Blumenthal & Tavenner, 2010). They are also facing the same time pressures, working with the same complement of end-users, and experiencing many of the same stress factors (Anthony et al., 2014).

The study recruited survey respondents from a quota sample of hospitals that were both implementing EHRs and generally reflected the U.S. community hospital population in terms of bed size and geographic location. A total of 74 hospitals were contacted and 45 agreed to participate and assist in the recruitment of their 2,430 IT professionals. Six hundred and thirty individuals (or 26%) participated in the survey, although 158 of the responses were ultimately eliminated due to more than 50% missing data. Therefore, the examination of the hypothesized relationships was conducted with a sample size of 472 which is considered to be a large sample for multivariate analysis (Hair et al., 2010). The analysis, presented in detail in Chapter 4, employed a number of statistical tests including correlation analysis, exploratory factor analysis and multiple hierarchical regression using SPSS (J. Cohen et al., 2003), confirmatory factor analysis and maximum likelihood structural equation modeling using LISREL (Hair et al., 2010), and bootstrapping using the INDIRECT macro for SPSS developed by K. J. Preacher and Hayes (2004).

Discussion of Findings with the Relevant Literature

This section presents a discussion of the findings in relation to the relevant literature which is used to interpret the conclusions drawn from the study. There were three key predictions in this study: 1) that two similarly conceptualized measures of employee engagement would evidence different relationships with the variables of workplace stress and burnout; 2) that the differences in these relationships would be revealed through an examination of each engagement measure's nomological framework (or subscales); and, 3) that the presence of social engagement improves engagement's resiliency against certain negative forces (or against the resource loss associated with

these forces) working against it (Hobfoll, 1989; Kahn, 1990, 1992, 2013). A summary of the overall findings associated with each hypothesis is presented in Table 30 on page 154. Although some of the individual hypotheses were not supported, the findings did affirm all three of the study's key predictions.

First, both needs-satisfaction based measures of employee engagement employed in this study evidenced the predicted negative relationships with workplace stress. This finding is consistent with Hobfoll's (1989) conservation of resources theory of stress (in that stress results when valued resources like time or positive working conditions are lost) and Kahn's (1990) theoretical conceptualization of engagement (as engagement requires psychological availability which, in turn, requires valued resources). Also, this study confirmed these relationships in a context that is under-studied in the scholarly literature—that is, among IT professionals working in community hospitals (Albrecht, 2010; Gan & Gan, 2013; Halbesleben, 2008c; Ivancevich et al., 1985; Sheng-Pao et al., 2011).

Next, the two employee engagement measures (and their subscales) evidenced significantly different relationships with workplace stress and burnout as described in Chapter 4 and summarized in Table 31. The specific difference predicted in the study's second hypothesis (H_2) was not supported, but a significant difference was, in fact, revealed. As these two engagement measures are similarly conceptualized based on Kahn's (1990) needs-satisfaction framework, it is useful to examine their similarities first.

Table 31. Comparison of Employee Engagement Measures and Their Relationships to Workplace Stress and Burnout

Engagement Measure	Negative Relationship with Workplace Stress	Negative Relationship with Burnout
Rich Overall Engagement • Physical[1] • Emotional[2] • Cognitive[3]	Moderate/Partially Mediated by Burnout (H_{1a}, H_2, H_{3a}) Non-Significant (H_{4a}) Strong/Partially Mediated by Burnout (H_{4b}) Weak (H_{4c})	Weak (H_{3a}) Non-Significant (H_{4a}) Strong (H_{4b}) Non-Significant (H_{4c})
ISA Overall Engagement • Intellectual[3] • Social[1] • Affective[2]	Strong/Partially Mediated by Burnout (H_{1b}, H_2, H_{3b}) Weak (H_{5a}) Strong (H_{5b}) Strong/Partially Mediated by Burnout (H_{5c})	Strong (H_{3b}) Non-Significant (H_{5a}) Non-Significant (H_{5b}) Strong (H_{5c})

[1]=unique (dissimilar) dimensions
[2]=conceptually and empirically similar dimensions
[3]=conceptually and empirically similar dimensions

Similarities Between the Rich and ISA Engagement Measures

The Rich Scale (Rich et al., 2010) and ISA Scale (Soane et al., 2012) both incorporate three subscales or dimensions of employee engagement. The Rich dimensions are physical, emotional and cognitive, and the ISA dimensions are intellectual, social and affective. It is not surprising, since both measures are grounded in Kahn's (1990) conceptualization, that some of their dimensions (or subscales) are very similar to each other, and these similarities well reflect the existing research related to these measures of employee engagement (Rich et al., 2010; Shuck et al., 2012; Soane et al., 2012).

For example, the Rich cognitive subscale and ISA intellectual subscale demonstrate both conceptual and empirical similarities. A review of Rich's 6-item cognitive dimension and ISA's 3-item intellectual dimension reveals the conceptual similarities. Rich et al. (2010) describe cognitive engagement as both a measure of

"attention (level of amount of focus and concentration) and absorption (level of engrossment or the intensity of the focus and concentration)" (pp. 623-624). Similarly, the ISA intellectual dimension is described as "the extent to which one is intellectually absorbed in work" (Soane et al., 2012, p. 532). In further support that these subscales are measuring similar aspects of employee engagement, the empirical data from this study showed that these two subscales both evidenced weak (but almost identical) negative relationships with workplace stress and no significant relationship with burnout.

This finding suggests that although, as predicted, an employee's focus or absorption at work may be weakly hindered by workplace stress, it is not impacted by the emotional exhaustion reflected by burnout. Considered in the context of conservation of resources theory (Hobfoll, 1989), the resource loss associated with workplace stress and burnout appears not to be strong enough to materially influence an employee's ability to concentrate. It is possible that the nature of IT work, which generally requires a high degree of technical precision and focus, may attract the type of employee that can remain "in-role" despite the resource loss associated with workplace stress and/or burnout (Kahn, 1992). Nevertheless, workplace stress and burnout evidenced almost identical results with the outcomes of this engagement domain in both the Rich and ISA scales.

Similarly, the Rich emotional subscale and the ISA affective subscale also demonstrate conceptual and empirical similarities. A review of Rich's 6-item emotional dimension and ISA's 3-item affective dimension reveals the conceptual similarities. Rich et al. (2010) describe emotional engagement as a measure of "enthusiasm, happiness and optimism experienced at work" (p. 623) and is based on research about core affect

(Russell & Barrett, 1999). Similarly, the ISA affective dimension is described as "the extent to which one experiences a state of positive affect [emotion] relating to one's work role" (Soane et al., 2012, p. 532). The statistical analysis of these two subscales supports the conclusion that the Rich emotional engagement and the ISA affective engagement subscales are measuring similar aspects of engagement as both evidenced significant negative relationships with workplace stress and significant negative relationships with burnout. Further, burnout partially mediated the negative relationships with workplace stress and both engagement subscales.

This finding was predicted and suggests that an employee's emotional state is highly impacted by the resource loss associated with both workplace stress and burnout (Hobfoll, 1989). In fact, this study's conceptualization of burnout is analogous to emotional exhaustion which logically explains the negative relationship to emotional or affective engagement (Malach-Pines, 2005). Indeed, in this study, workplace stress and burnout evidenced almost identical results with the outcomes of this engagement domain in both the Rich and ISA scales.

Given the above similarities, this study's findings suggest that the two remaining dimensions (i.e., the physical engagement from the Rich Scale and social engagement from the ISA Scale) must explain the significant differences in the relationships when engagement is measured at the overall (all subscales) level. Indeed, the remaining two dimensions measure fundamentally different aspects of employee engagement and, in this study, both evidenced very different relationships with workplace stress and burnout.

Differences Between the Rich and ISA Engagement Measures

The Rich physical dimension was the only dimension (in either engagement measure) that evidenced no significant relationship with either workplace stress or burnout. (Importantly, the weak relationship with workplace stress and physical engagement shown in the structural model with all of the Rich subscales [Figure 12] was significant only in the presence of the other subscales.) Rich et al. (2010) describe physical engagement as based upon a combination of work intensity as conceptualized by Brown and Leigh (1996) and physical engagement as conceptualized by Kahn (1992). This 6-item subscale includes questions about "working with intensity," "exerting full effort," "trying [one's] hardest," and "exerting a lot of energy on [the] job" (Rich et al., 2010, p. 634).

The non-significant findings in this study suggest that neither workplace stress nor burnout affects an employee's physical engagement or level of energy/intensity at work. Seemingly counterintuitive, there may be reasonable explanations for this. First, the specific context of this study—namely, IT professionals working to implement EHRs in U.S. hospitals—might skew the relationship between workplace stress and physical engagement due to the unique nature of the circumstances under which the survey respondents are currently working. In other words, all of these professionals are working toward a federally mandated deadline for EHR adoption by 2015, and the consequences for not meeting that deadline include significant financial penalties to their hospital employers. As such, it is possible that the energy they exhibit toward their work may be

more a function of the pressure they feel than the sense of physical engagement that the measure was intending to capture.

Another explanation may reside within the physical engagement survey questions themselves. Unlike the other questions (from either of the two engagement instruments) which relate to concentration, focus, happiness or social connectedness, the physical dimension is the only one in which respondents must indicate their perceptions of how hard they are working. Interestingly, as shown in Table 13 and Table 14, the mean score for physical engagement is the highest of all engagement means (4.54 out of 5.00). Although attempts to minimize the possibility of bias due to social desirability (Tsai & Ghoshal, 1998) were made in this study, there is still a possibility that this particular set of questions, which asks respondents about perceptions of their own personal work ethic, was influenced either by cognitive dissonance or by a reluctance to admit something thought to be inconsistent with their choice to remain in their jobs (Bertrand & Mullainathan, 2001). This cognitive effect could result in both higher mean scores and a confounded (or, as in this study, a non-significant) relationship with workplace stress.

Turing to the ISA social engagement subscale, this dimension was also unique among the other dimensions in both employee engagement scales as it evidenced the predicted strong negative relationship with workplace stress, but no relationship with burnout. Conceptually, this 3-item dimension appears to measure an aspect of engagement not contemplated by the Rich Scale. It is described as "the extent to which one is socially connected with the working environment and shares common values with colleagues" (Soane et al., 2012, p. 532). This dimension is grounded in Kahn's clear

contention that connectedness or positive interpersonal relationships at work are key to employee engagement (Kahn, 2013).

From an empirical perspective, Table 14 shows that the mean for social engagement is well above the midpoint of its scale (4.96 out of 7.00). This suggests that the level of social connectedness or positive interpersonal relationships at work is fairly strong in this sample of IT professionals despite its strong negative relationship with workplace stress. The mediating effect of burnout was hypothesized to only partially explain the negative relationship between workplace stress and social engagement based upon Kahn's (2007b, 2013) contention that positive interpersonal relationships at work improve the resiliency of engagement in relation to those variables that may otherwise seek to negatively influence it. However, it appears that these relationships are strong enough (even in the face of workplace stress) to completely resist the negative effect of burnout. These findings both support Kahn's (2007b, 2013) position about the positive effect of strong interpersonal relationships on employee engagement and are consistent with Hobfoll's (1989) premise that these relationships are resources which work to offset the negative effects of stress or burnout.

Impact of Subscales on Overall Measures of Employee Engagement

Upon review of the correlation analysis and each overall measure of employee engagement (Table 13 and Table 14), the Rich overall engagement scale shows fairly weak relationships with both workplace stress and burnout. This is likely due to the very weak relationship between both independent variables (i.e., workplace stress and burnout) and its cognitive dimension and the non-significant relationship between both

independent variables and its physical dimension. On the other hand, the ISA overall engagement scale shows fairly strong negative relationships with the two independent variables. The strong relationship with workplace stress is likely due to the strong relationship with both affective and social engagement, and the relationship with burnout is likely due to the strong relationship with its affective dimension.

Yet, in the mediated models with burnout and the overall measures of employee engagement (Figure 10 and Figure 11), the resultant relationships between both overall measures and workplace stress are almost identical. In other words, burnout explained more of the negative relationship between workplace stress and the ISA Scale than it explained between workplace stress and the Rich Scale. This suggests that the ISA overall measure is more sensitive to the effect of burnout despite the fact that the correlation analysis indicates that two of its three dimensions have non-significant relationships with burnout. Again, an explanation for this is found within the ISA subscales and when the relationships with the subscales and independent variables are modeled simultaneously (Hair et al., 2010).

As discussed, affective engagement has a strong negative relationship with burnout and although intellectual engagement has a non-significant relationship with burnout on its own, in the presence of the other ISA subscales, it also has a significant, albeit weak, negative relationship with burnout. This suggests that the negative effect of burnout on the combination of affective and intellectual engagement serves to increase both the negative relationship between burnout and ISA overall engagement and the indirect effect of burnout on the ISA overall engagement scale in comparison to the Rich

overall engagement scale. However, social engagement reflects interconnectedness, positive shared values and positive relationships among coworkers (Soane et al., 2012) and, consistent with the literature, the presence of this phenomenon appears to mitigate the negative effect of burnout on social engagement. Were it not for an examination of the ISA subscales, the positive impact of social engagement (and the interventions it suggests) could be overshadowed by the negative relationships evidenced with the other two ISA dimensions.

Employee Engagement and Burnout

Although not specifically hypothesized, this study also sought to examine the relationship between burnout and employee engagement in hopes of addressing some of the tensions in the literature regarding the nature of this relationship (Fletcher & Robinson, 2013; Shuck, 2011). The burnout measure used in this study is grounded in the widely-accepted conceptualization of burnout as synonymous with emotional exhaustion (Schaufeli & van Dierendonck, 1993). Although this study's findings evidenced significant negative relationships between burnout and both overall measures of employee engagement, an examination of the measures' subscales revealed that this negative relationship was almost entirely attributable to the emotional/affective dimensions. In other words, burnout (or emotional exhaustion) was negatively related only to emotional (or affective) engagement as measured by both the Rich Scale and the ISA Scale. While seemingly obvious, this finding highlights another observation: that despite the preponderance of research which positions burnout either on the same continuum as engagement or as the antipode of engagement, burnout exhibited either

very weak or no relationships with any dimension of employee engagement that was not measuring emotion. It also clarifies that engagement measures which are conceptually dominated by the concepts of affect or emotion (for example, the MBI, UWES, OLBI and SMVM) may, in all likelihood, be measuring the antithesis of burnout. And, according to Kahn (2013), the antithesis of burnout is not the same as employee engagement.

Conclusions and Implications for Theory

A consistent understanding of employee engagement remains elusive due to its many conceptualizations and operationalizations (Keenoy, 2014; Shuck et al., 2012). Recently, the lack of clarity about this construct was described as follows: "Although it finds its origin in the positive psychology of Kahn (1990), … [engagement] has, in effect, taken on a life of its own (or, more precisely, a series of parallel lives)" (Keenoy, 2014, pp. 197-198). It is the contention of this study that these "parallel lives" are, in fact, leading to an increased risk that the term "engagement" is becoming overly generalized and that, as a consequence, its utility in practice is compromised. Many scholars agree and are calling for more detailed examinations of the nomological framework and thus, the measurement, of employee engagement (Nimon et al., 2014; Shuck et al., 2014).

Therefore, one of this study's most significant contributions to the scholarly literature is that it offers a nuanced explanation of some of the differences in how employee engagement is measured and how those differences may impact organizational HRD efforts. Although this study employed two needs-satisfaction based measures of employee engagement to illustrate this point, its dimensional-level findings may also

clarify measures of engagement that are conceptualized based upon a burnout-antithesis framework. Specifically, the findings with the Rich emotional dimension and the ISA affective dimension, which showed strong negative relationships with burnout, suggest that burnout-antithesis framed measures of employee engagement (which are largely dominated with questions about affect) are, in fact, measuring the antithesis of burnout or, said another way, the antithesis of emotional exhaustion. Although scholars may debate whether the antithesis of burnout is, in fact, the same thing as employee engagement, this study offers further insight into what exactly these measures may be measuring.

The key premise of this study was that even similarly conceptualized measures of employee engagement would reveal different relationships with workplace stress and burnout, and that these differences would be important in understanding both what the measures are actually measuring. Again, the findings show that these differences are only understood when examining the relationships at the domain or dimensional levels of each of the engagement measures. Indeed, this study confirms that even though both measures of employee engagement employed in the proposed study are conceptually based on Kahn's (1990) needs-satisfaction framework, they too do not measure the same aspects of employee engagement. As a result, different suggestions for the utility of each measure and different workplace interventions suggested by each measure can be teased out of these findings.

There is an interesting theoretical implication as well. Of the three constructs under examination in this study, workplace stress and burnout benefit from fairly

consistent theoretical conceptualizations. However, employee engagement is conceptualized by (at least) four major frameworks which means, as suggested by Saks (2008), that engagement has become an "umbrella term" (p. 40) inclusive of different meanings, measures and research agendas (Shuck et al., 2012). Not only does this over-generalization confuse the understanding of employee engagement, it spawns continued debate as to its uniqueness in comparison to other, more clearly defined, organizational phenomena (Newman et al., 2010; Newman et al., 2011).

Although scholars may continue to debate the efficacy of the various conceptualizations and related operationalizations of employee engagement, this study strongly suggests that, regardless of conceptualization, employee engagement is domain specific and thus, the meaning of the construct is only revealed upon examination of the dimensional level of engagement instruments. In other words, specificity about the dimensional levels of employee engagement may be precisely what scholars and HRD practitioners are seeking in order to better understand and operationalize the construct (Albrecht, 2010; Ferris, 2013).

Implications for Practice

The following section describes a number of implications that the study's findings suggest for practice within healthcare IT, the broader business context, and for HRD.

The Relationships Between Workplace Stress, Burnout and Employee Engagement

Although this study focused on differences in the measurement of employee engagement, important relationships with workplace stress and burnout were also revealed. It is clear that workplace stress and burnout negatively effects employee

engagement, as evidenced by both overall measures employed in this study and by most of the subscales within each measure. Further these negative relationships are particularly strong with the emotional or affective subscales of engagement.

These engagement domains are predicated on the presence of enthusiasm, optimism and positive emotions at work. Therefore, in accordance with COR theory, workplace interventions designed to mitigate the negative effects of stress on employee engagement might include frequent and constructive feedback, team building exercises and the establishment of clear goals and celebrations of success (Hobfoll, 2011). Additional interventions that lessen the likelihood of emotional exhaustion (such as social support programs) may serve to limit the development of burnout and also improve the resilience of employee engagement (Halbesleben, 2006; Kahn, 2007b).

With respect to the population of employees contemplated by this study, additional considerations may be warranted related to interventions targeted at stress reduction (Hobfoll, 1989, 2011). In accordance with COR theory, role conflict, in which individuals perceive conflicting demands at work (such as IT professionals working to meet federally mandated deadlines in order to maximize federal incentive dollars while trying to ensure the adequacy and thoroughness of their testing efforts) represents a clear stressor and might be mitigated by better resource allocation, improved communications, and the development of trusting culture in which IT professionals feel safe to express their concerns. Role ambiguity, in which individuals perceive they lack the skills or information to adequately do their jobs (such as IT professionals working to optimize a care delivery process) represents yet another stress inducer and might be addressed by

teaming IT professionals with clinical resources who better understand clinical processes. Finally, role-stress fit, in which job roles become misaligned with expected stressors (such as IT professionals facing the wrath of physicians who are frustrated with new federal requirements), represents a significant resource loss that is associated with feelings of emotional exhaustion and depersonalization (LeRouge et al., 2006; Pfennig & Husch, 1994; Schaufeli & Buunk, 2002). This too might be mitigated by the establishment of organizational norms in which IT professionals are empowered and encouraged to request assistance from management staff in cases where they fear confrontation or other misalignment.

The Measurement of Employee Engagement

Understanding the role that engagement plays in the workforces of hospitals (or in any organizational setting) presumes a clear understanding of the meaning behind the measurement of employee engagement in relation to other variables. However, this meaning requires an equal understanding of what the measures of employee engagement are actually measuring and what the outcomes of such engagement measures are suggesting in terms of workplace practice.

As previously discussed, four frameworks for conceptualizing and operationalizing employee engagement have been identified in the scholarly literature (Fletcher & Robinson, 2013; Shuck, 2011). The results from this study strongly suggest that, both within and among these four frameworks, employee engagement is domain (or dimensionally) specific and that differences in the use of these domains may determine the outcome of an employee engagement study. Thus, it can be reasonably inferred from

this study that the measurement instruments within each of these frameworks will all have different predictive properties and thus, different utility. In practice, the difference in the employee engagement dimensions may often be regarded as immaterial (and thus, ignored), particularly if the measurement instrument is used merely for predictive purposes. However, this study showed that, depending on the dimensions included in the engagement measurement scale, the predicted outcomes may be different (Shuck, 2011).

This suggests that if HRD practitioners or workplace managers want to obtain a broad picture of the engagement levels of their employees or understand whether workplace stress generally predicts engagement, then the choice of employee engagement instrument is less critical. However, if the goal is to better understand *why* stress translates into lower engagement levels, then the choice of measurement instrument (and its accompanying dimensions) may determine the outcome. For example, if organizations are interested in measuring the impact of workplace stress on the affective or emotional elements of engagement, then either a burnout-antithesis based measure of engagement or the emotional/affective dimensions from the Rich Scale or ISA Scale may be appropriate. Alternatively, if organizations seek to understand the impact of stress on interpersonal relationships or social connectedness at work, then ISA's social dimension may be the only measure sensitive to that specific domain of employee engagement.

In terms of organizational development, the selection of employee engagement measurement instruments should also be considered in the context of what the organization is considering in terms of workplace interventions (Shuck, 2011). This study shows that since even similarly conceptualized measures of employee engagement

do not measure the same aspects of engagement, the workplace interventions suggested by the outcomes may also vary. Further, different domains of engagement may be more or less sensitive to the impact of certain interventions.

For example, Rich Scale findings suggest that since neither workplace stress nor burnout have a strong negative effect on engagement, then workplace environments that are generally meaningful to employees, psychologically safe and supported by sufficient resources will likely result in an engaged workforce (Kahn, 1990). On the other hand, the ISA Scale findings, which reveal much stronger relationships with both workplace stress and burnout, also show that social connectedness or strong interpersonal relationships at work serve to mitigate the negative effects of both. This implies that while stress and burnout do, in fact, impact employee engagement, efforts to build a positive, trusting culture may be a powerful force against those negative effects. Further, these findings lend credence to Kahn's (2013) contention that the most important engagement-related initiative an organization can undertake might be one in which leaders, co-workers and peers are trained on how to create and foster environments conducive to the development of positive relationships at work (Kahn, 2007b). However, an intervention suggested by the ISA Scale (like, for example, the launch of a leadership development program focused on training leaders to create positive and trusting environments where taking risk is not personally risky), may only be evident when engagement is measured by the ISA Scale and, more specifically, by the social dimension of that scale.

Overall Implications

The study of employee engagement has expanded significantly since Kahn's (1990) original conceptualization. As scholars continue to confirm both the construct validity and the uniqueness of engagement in comparison to other better known job-related constructs such as job satisfaction, job involvement and organizational commitment (Nimon et al., 2014; Shuck et al., 2014), its utility as a measureable organizational outcome will continue to increase. Indeed, HRD practitioners are particularly interested in engagement-related concerns in healthcare—an industry that has provided and continues to provide great fodder for the study of organizational change and the consequential impact on employee engagement—but also in other industries, work contexts and countries (Albrecht, 2010; Truss, Delbridge, Kerstin, Shantz, & Soane, 2014).

Some argue that the uncertainties and changes currently facing hospitals and their employees—pressure to downsize, cultural impact of mergers, adoption of disruptive technologies, reorganization of key processes—are similar to those facing many, if not most, other industries, employers and employees. It is both intuitive and the contention of numerous researchers that engaging the workforces of healthcare organizations, and by extension, all organizations, will be one of the key human resource-related strategic imperatives necessary to successfully accomplish these change initiatives (Albrecht, 2010; Halbesleben, 2008b; Kahn, 2010). But, if employee engagement is to become a relevant barometer against which certain organizational change efforts are measured, then clarity about what is actually being measured becomes important.

To the extent that this study contributes to the scholarly literature by explaining some of the differences in how employee engagement is measured and how those differences may impact organizational HRD efforts, then it helps all parties seeking to operationalize this phenomenon. Further, this study suggests that disagreements about the differences in the operationalization of employee engagement are less important than furthering the collective understanding about the differences so as to inform practitioners about the use of the best instrument(s) to match their organizational objectives.

Limitations and Recommendations for Future Research

The study of employee engagement and an understanding of both its conceptualization and operationalization in practice are clearly an area of great interest to both scholars and practitioners (Shuck & Reio, 2011). This study has endeavored to deepen the understanding of employee engagement measurement and to clarify the impact of such measurement on the relationships with workplace stress and burnout. However, as with all studies, this one is not without limitations (as articulated in Chapters 3 and 4). Yet, these limitations can be overcome and can serve as catalysts for future research aimed at improving the generalizability and utility of this study's findings and extending this research agenda within the employee engagement arena. Therefore, the following recommendations for future research are offered.

Extend the Comparison of Engagement Measurement

The underlying research for this study identified four different frameworks for understanding engagement published in the scholarly literature: needs-satisfaction, burnout-antithesis, job satisfaction and multi-dimensional (Shuck, 2011). Meta-analytic

reviews that compared the measurements of burnout, job satisfaction and engagement provided valuable insight as to certain similarities and differences. However, an empirical comparison of all the engagement (or engagement-related) measurement instruments published in the scholarly literature has not been completed (Christian et al., 2011; Cole et al., 2012).

This study is a first step as it compares two similarly conceptualized measurements of employee engagement, but there would be considerable value and utility in expanding this analysis to other conceptualizations and related operationalizations of this construct. Further research that extends the comparison to all of the published measurement instruments (and their dimensions) and examines their relationships to variables (like workplace stress and burnout) and to certain antecedents and/or outcomes would further the collective understanding of employee engagement. To the extent that such research 1) clarifies the theoretical concepts that underpin each operationalization; 2) reveals what these instruments are actually measuring; 3) confirms, as Shuck (2011) suggests, that the choice of engagement measure should be intentional based on what aspect of engagement the researcher is trying to measure; and, 4) sparks a fuller understanding of how to interpret the antecedents and outcomes of employee engagement, then the scholarly and business communities will undoubtedly be benefitted.

There is little doubt that there are fundamental differences between both the burnout-antithesis and job satisfaction conceptualizations of engagement and Kahn's (1990) needs-satisfaction based one. Further, recent comparisons of employee engagement and other job-related constructs are continuing to clarify the meaning of

employee engagement as an organizational phenomenon (Nimon et al., 2014; Shuck et al., 2014). However, it seems that the utility of an engagement measurement instrument lies in the efficacy of its use in practice. The scholarly and business communities should continue to question these instruments, seek to discern further clarity as to what they are suggesting, and employ methods to test (longitudinally) the impact of certain workplace interventions (such as the development of a positive, trusting culture) on the critical yet elusive phenomenon of employee engagement. To not do so risks that the concept of engagement will lose its impact as a positive, actionable organizational force.

Positive Interpersonal Relationships at Work and Employee Engagement

The findings from this study, while designed to examine differences in the relationships between certain variables and different operationalizations of employee engagement, also support the theory that social connectedness or positive, interpersonal relationships at work (a key element of trust) may mitigate the negative effect of burnout on engagement. This is consistent with conservation of resources theory in that positive relationships are clearly "resources" which work to offset the effects of resource loss due to stress or burnout (Hobfoll, 1989). It is also consistent with Kahn (2007b, 2013) in that positive interpersonal relationships at work are key to the sustained engagement of employees.

One of the most widely accepted integrative models of interpersonal trust (a key element of positive relationships) suggests that an individual's willingness to both accept personal vulnerability and maintain positive expectations about others was definitional to workplace trust (Mayer et al., 1995). Studies that operationalized this model established

that there are different targets of trust: an employee's trust in his/her co-workers, supervisor and organization (Ferres, 2002; Ferres et al., 2004; M. D. Spector & Jones, 2004; Tan & Tan, 2000). This perspective is consistent with those who view workplace trust as foundational to positive interpersonal relationships and psychological safety and thereby key to employee engagement (Kahn, 1990, 2007b; Macey & Schneider, 2008).

Further research that extends the potential clarification of engagement and engagement measurement through the examination of employee trust (in peers, co-workers and supervisors) relative to perceptions of employee engagement may be exceptionally valuable.

State vs. Trait

While elucidation of the measurement of engagement is vital, a key theoretical question relates to the persistence of engagement within individuals versus "engagement in the moment" (Christian et al., 2011, p. 121). In other words, engagement may be a relatively stable trait which, like burnout, emerges after an accumulation of those psychological conditions and/or resources that sustain the investment of employees' personal energies and thus differs only between individuals. Or, as Kahn (1990) suggests, engagement may reflect a temporal condition that can fluctuate daily and ebb and flow within individuals.

Kahn's (1990) original definition of psychological availability, as of one his three psychological pre-conditions of engagement, included the reference that people engage "*at a particular moment*" (p. 714). However, an analysis by Christian et al. (2011) was inconclusive as to this phenomenon suggesting that further research might explore the

differences between within-person and between-person engagement levels. Whereas Christian et al. (2011) believe that within-person variances are unlikely, the question remains as to whether or not there is something about engagement which, unlike burnout, is not an end-state.

This study did not address this specific question, but if the state of positive interpersonal relationships at work plays a critical role, then engagement as a state may be both theoretically supported and plausible. In other words, employee engagement may persist, even in the face of significant workplace stress and/or burnout, when positive, trusting relationships at work are present—assuming that the instrument used to measure employee engagement is sensitive to the presence of such relationships. Research that explores this phenomenon and further examines whether employee engagement levels vary depending on the level of trust among workplace actors, the circumstances, the availability of resources, and/or other variable(s) would be valuable to scholars and to business leaders charged with developing and maintaining work environments conducive to the engagement of workforces.

Alternative Relationships Between Workplace Stress and Employee Engagement

This study's findings show clear negative relationships between workplace stress and employee engagement. Whereas one of this study's major assumptions is that the relationship between workplace stress and engagement is linear, some scholars suggest that this relationship may be curvilinear (Gorgievski & Hobfoll, 2008; Nelson & Simmons, 2003). If higher levels of stress negatively affect engagement, but lower levels of workplace stress "fire us up" (Gorgievski & Hobfoll, 2008, p. 7), then a re-analysis of

the variables examined in this study in light of a curvilinear relationship may be very enlightening and suggest other workplace interventions related to sustaining employee engagement.

The literature supports the plausibility of positive relationships between workplace stress and employee engagement when the stressors are accompanied by other factors such as meaningful or exciting work, positive feedback or sufficient resources to overcome stress-inducing obstacles (like tight deadlines, for example) (Gorgievski & Hobfoll, 2008). Further, even stress-inducing high job demands can positively impact employee engagement if meeting those demands results in something perceived as valuable to the employee (such as a raise, promotion or other recognition) (Gorgievski & Hobfoll, 2008). The relationship between workplace stress and positive, interpersonal relationships at work (both a foundational aspect of employee engagement and a resource under COR theory) may also exhibit positive tendencies because, in the face of workplace stress, such interpersonal relationships can foster both camaraderie and a sense of shared experience leading to the positive effect of having accomplished something difficult together (Gorgievski & Hobfoll, 2008; Hobfoll, 1989; Kahn, 2007b).

Over time, conservation of resources theory suggests that the compensatory effort required to overcome the resource loss associated with stressful working conditions will eventually take its toll (Hobfoll, 1989, 2011). However, the idea that some workplace stressors, particularly those that are balanced with other valued resources, may actually drive employee engagement is an area worthy of further study. Both scholars and practitioners would benefit from a better understanding of 1) where these balance points

might be; 2) the impact of time or duration on these balance points; and, 3) when and/or how workplace stress moves from motivating to exhausting.

Pre- and Post-Intervention Studies

Whereas substantial research exists around both the antecedents and consequences of employee engagement, few studies have examined the impact on employee engagement before and after workplace interventions targeted to improve levels of such engagement (Nimon, 2014). From a practitioner's perspective, longitudinal studies might be the most valuable type of research because their findings will likely suggest interventions that are specific, actionable and measureable. For example, this study's findings suggest that the negative effects of workplace stress and burnout are mitigated by social connectedness or positive interpersonal relationships at work. However, they also indicate that the emotional or affective aspects of employee engagement are strongly affected by the negative forces of workplace stress and burnout.

This suggests that interventions designed to strengthen interpersonal relationships at work may improve employee engagement even in the face of significant workplace stress and/or burnout. Importantly, this can be studied longitudinally in order to determine which interventions have the most significant impact. Again though, such studies will only be valuable if the measures of employee engagement are well understood as to both their conceptual underpinnings and sensitivities to certain contexts in practice. For example, The ISA Scale, which evidenced excellent reliability and validity in this study and was shown to be sensitive to the presence of social connectedness or positive interpersonal relationships at work, may be a good choice for

researchers interested in measuring the longitudinal impact of such an intervention on employee engagement.

Different Contexts and Different Measures

As previously mentioned, it is possible that the nature of IT work, which generally requires a high degree of technical precision and focus, may attract the type of employee that exhibits the specific relationships with workplace stress, burnout and employee engagement revealed in this study. Therefore, it is recommended that this study be replicated with different occupational groups and/or job roles from both within and outside the healthcare industry. An examination of these relationships in different countries and/or cultures would also further inform the employee engagement literature.

This study's measurement of workplace stress utilized the Workplace Stressors Assessment Questionnaire because of its theoretical underpinning in COR and psychometric development with high-tech employees in the U.S. (Mahmood et al., 2010). However, there are many similarly conceptualized measures of workplace stress published in the scholarly literature and this study should be replicated with one or more of those measures. Similarly, the Burnout Measure, Short Version was selected based on its exhaustion-based conceptualization and because it had not also been used as a proxy for the measurement of engagement (through its reverse scores) (Malach-Pines, 2005). Replicating this study with other similarly conceptualized burnout measures would improve the generalizability of these findings.

Summary of the Chapter

This chapter presented a brief summary of the study. It then discussed the findings of the study in relation to the existing literature based upon the data analysis in Chapter 4. Importantly, the chapter outlined how the findings supported this study's three key predictions and concludes: 1) that two similarly conceptualized measures of employee engagement evidence different relationships with the workplace stress and burnout; 2) that the differences in these relationships are revealed through an examination of each engagement measure's nomological framework (or subscales); and 3) that the presence of social engagement improves engagement's resiliency against certain negative forces (or against the resource loss associated with these forces) working against it (Hobfoll, 1989; Kahn, 1990, 1992, 2013).

Conclusions from the study and implications for theory were presented, followed by implications for practice within healthcare IT, the broader business context, and for human resource development. Finally, a number of recommendations for future research were discussed.

References

Affordable Care Act. (2010). *U.S. Department of Health and Human Services*. http://www.healthcare.gov/law/full/index.html

AHA. (2012a). 2013 American Hospital Association environmental scan. *Hospitals and Health Networks, 86*(9).

AHA. (2012b). Economic contribution of hospitals: Hospital employment by occupation type. from http://www.aha.org/research/reports/tw/chartbook/2012/chart6-6.pdf

AHA. (2013). Fast facts on US hospitals. from http://www.aha.org/research/rc/stat-studies/fast-facts.shtml

AHD. (2013). Hospital statistics by state. from http://www.ahd.com/state_statistics.html

Alarcon, G. M., & Edwards, J. M. (2011). The relationship of engagement, job satisfaction and turnover intentions. *Stress and Health, 27,* e-294-e298.

Albrecht, S. L. (Ed.). (2010). *The handbook of employee engagement: Perspectives, issues, research and practice*. Northhampton, MA: Edward Elgar Publishing.

Alderfer, C. P. (1972). *Human needs in organizational settings*. New York: The Free Press of Giencoe.

American Recovery and Reinvestment Act of 2009, PL 111-5 C.F.R. (2009).

Anthony, P. (2012). *The relationships between workplace stress, burnout and engagement: A preliminary literature review*. Unpublished paper. The University of Texas at Tyler.

Anthony, P., Lunn, M. L., Maffei, S., & Ellinger, A. (2014). *Examining employee engagement issues in healthcare: What we know and where we need to go.* Paper presented at the 2014 AHRD International Conference in the Americas, Houston, TX.

Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research, 14*(3), 396-402.

Babbott, S., Manwell, L. B., Brown, R., Montague, E., Williams, E., Schwartz, M., . . . Linzer, M. (2013). Electronic medical records and physician stress in primary care: Results from the MEMO Study. *Journal of the American Medical Informatics Association*. doi: 10.1136/amiajnl-2013-001875

Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & Stress, 22*(3), 187-200. doi: 10.1080/02678370802393649

Baron, R. M., & Kenny, D. A. (1996). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 31*(6), 1173-1182.

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations, 61*, 1139-1160.

Beitler, M. A. (2006). *Strategic oganizational change* (Second ed.). Greensboro: Practitioner Press International.

Bertrand, M., & Mullainathan, S. (2001). Do people mean what they say? Implications for subjective survey data. *American Economic Review, 91*(2), 67-72.

Blumenthal, D. (2009). Stimulating the adoption of health information technology. *New England Journal of Medicine, 360*(15), 1477-1479. doi: 10.1056/NEJMp0901592

Blumenthal, D., & Tavenner, M. (2010). The "Meaningful Use" regulation for electronic health records. *New England Journal of Medicine, 363*(6), 501-504. doi: 10.1056/NEJMp1006114

Brooks, R., & Grotz, C. (2010). Implementation of electronic medical records: How healthcare providers are managing the challenges of going digital. *Journal Of Business & Economics Research, 8*(6).

Brown, S. P., & Leigh, T. W. (1996). A new look at psychological climate and its relationship to job involvement, effort and performance. *Journal of Applied Psychology, 81*(4), 358-368.

Bryman, A., & Bell, E. (2011). *Business research methods* (3rd ed.). New York: Oxford University Press.

Burke, W. W. (2011). *Organizational change: Theory and practice* (3rd ed.). Los Angeles: Sage Publications.

Burnette, J. L., & Williams, L. J. (2005). Structural equation modeling (SEM): An introduction to basic techniques and advanced issues. In R. A. Swanson & E. F. Holton (Eds.), *Research in organizations: Foundations and methods of inquiry* (pp. 143-160). San Fransisco: Barrett-Keohler Publishers.

CDC. (2011). Hospitals, beds, and occupancy rates, by type of ownership and size of hospital: United States. from http://www.cdc.gov/nchs/data/hus/2011/116.pdf

Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Personnel Psychology, 64*(1), 89-136. doi: 10.1111/j.1744-6570.2010.01203.x

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). New Work: Routledge.

Cohen, S., Karmark, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385-396.

Cole, M. S., Walter, F., Bedeian, A. G., & O'Boyle, E. B. (2012). Job burnout and employee engagement: A meta-analytic examination of construct proliferation. *Journal of Management, 38*(5), 1550-1581.

Conway, J. M., & Lance, C. E. (2010). What reviewers should expect from authors regarding common method bias in organizational research. *Journal of Business & Psychology, 25*(3), 325-334. doi: 10.1007/s10869-010-9181-6

Cotter, C. (2012). [Personal interview with the Chief Information Officer of Lifespan on June 8, 2012].

Demerouti, E., & Bakker, A. B. (2007). *The Oldenburg Burnout Inventory: A good alternative to measure burnout (and engagement)*. Utrecht University and Erasmus University Rotterdam.

Demerouti, E., Bakker, A. B., & Mostert, K. (2010). Burnout and engagement: A thorough investigation of the independency of both constructs. *Journal of Organizational Health Psychology, 15*(3), 209-222.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*(3), 499-512. doi: 10.1037//0021-9010.86.3.499

Demerouti, E., Bakker, A. B., Vardakou, I., & Kantas, A. (2002). The convergent validity of two burnout instruments: A multitrait-multimethod analysis. *European Journal of Work and Organizational Psychology, 19*(1), 12-23.

DesRoches, C. M., Campbell, E. G., Vogeli, C., Zheng, J., Rao, S. R., Shields, A. E., . . . Jha, A. K. (2010). Electronic health records' limited successes suggest more targeted uses. *Health Affairs, 29*(4), 639-646. doi: 10.1377/hlthaff.2009.1086

Deutsch, M. (1958). Trust and suspicion. *Journal of Conflict Resolution, 2*, 265-279.

Doty, D. H., & Glick, W. H. (1998). Common methods bias: Does common methods variance really bias results? *Organizational Research Methods, 1*(4), 374-406.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*, 350-383.

Electronic Health Record. (2012). Retrieved March 25, 2012, from http://www.himss.org/ASP/topics_ehr.asp

Elliott, G. R., & Eisdorfer, C. (1982). *Stress and human health*. New York: Springer.

Employee Engagement Initiative. (2013). Retrieved March 16, 2013, from http://www.advisory.com/Talent-Development/Employee-Engagement-Initiative

Enzmann, D., Schaufeli, W., Janssen, P., & Rozeman, A. (1998). Dimensionality and validity of the Burnout Measure. *Journal of Occupational & Organizational Psychology, 71*(4), 331-351.

Ferres, N. (2002). *Development of the workplace trust questionnaire.* (Unpublished masters thesis), University of Newcastle, Callaghan.

Ferres, N., Connell, J., & Travaglione, A. (2004). Co-worker trust as a social catalyst for constructive employee attitudes. *Journal of Managerial Psychology, 19*(6), 608-622.

Ferris, L.-A. (2013). The engagement equation: Leadership strategies for an inspired workforce. *Human Resource Development Quarterly, 24*(3), 413-416. doi: 10.1002/hrdq.21166

Fletcher, L., & Robinson, D. (2013). Measuring and understanding engagement. In C. Truss, K. Alfes, R. Delbridge, A. Shantz & E. Soane (Eds.), *Employee engagement in theory and practice*. New York: Routledge.

Freudenberger, H. (1975). The staff burnout syndrome in alternative institutions. *Psychotherapy: Therory, Research and Practice, 12*, 72-83.

Freudenberger, H. (1986). The issues of staff burnout in therapeutic communities. *Journal of Psychoactive Drugs, 18*(3), 247-251.

Friedman, H. (1982). Simplified determinations of statistical power, magnitude of effect and research sample sizes. *Educational & Psychological Measurement, 42*(2), 521.

Gagnon, M., Ouimet, M., Godin, G., M, R., M, L., Leduc, Y., & Abdeljelil, A. (2010). Multi-level analysis of electronic health record adoption by health care professionals: A study protocol. *Implementation Science*, 5-30. doi: 10.1186/1748-5908-5-30

Gagnon, M., Shaw, N., Sicotte, C., Mathieu, L., Leduc, Y., Duplantie, J., . . . Légaré, F. (2009). Users' perspectives of barriers and facilitators to implementing EHR in Canada: A study protocol. *Implementation Science*, 4-20. doi: 10.1186/1748-5908-4-20

Gan, T., & Gan, Y. (2013). Sequential development among dimensions of job burnout and engagement among IT employees. *Stress and Health*. https://ezproxy.uttyler.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=23818403&site=eds-live&scope=site

Golembiewski, R. T. (1999). The phase model of burnout: Conceptual, theoretical and practice issues. *Journal of Health and Human Services Administration, 21*(4), 490. doi: 10.2307/25780926

Gorgievski, M. J., & Hobfoll, S. E. (2008). Work can burn us out or fire us up: Conservation of resources in burnout and engagement. In J. R. B. Halbesleben (Ed.), *Handbook of stress and burnout in health care* (pp. 7-22). New York: Nova Science Publishers.

Gostin, L. O. (2012). The Supreme Court's historic ruling on the affordable care act: Economic sustainability and universal coverage. *Journal of the American Medical Association, 308*(6), 571-572.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis*. Upper Saddle River, NJ: Prentice Hall.

Halbesleben, J. R. B. (2006). Sources of social support and burnout: A meta-analytic test of the conservation of resources model. *Journal of Applied Psychology, 91*(5), 1134-1145.

Halbesleben, J. R. B. (2008a). Introduction: Stress, burnout and health care. In J. R. B. Halbesleben (Ed.), *Handbook of stress and burnout in health care*. New York: Nova Science Publishers.

Halbesleben, J. R. B. (2008b). Stress and burnout in health care: Where do we go from here? In J. R. B. Halbesleben (Ed.), *Handbook of stress and burnout in health care* (pp. 217-226). New York: Nova Science Publishers.

Halbesleben, J. R. B. (2010). A meta-analysis of work engagement: Relationships with burnout, demands, resources, and consequences. In B. B. Arnold & M. P. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 102-117). New York: Psychology Press.

Halbesleben, J. R. B. (Ed.). (2008c). *Handbook of stress and burnout in health care*. New York: Nova Science Publishers.

Halbesleben, J. R. B., & Demerouti, E. (2005). The construct validity of an alternative measure of burnout: Investigating the English translation of the Oldenburg Burnout Inventory. *Work & Stress, 19*(3), 208-220.

Harrison, D. A., Newman, D. A., & Roth, P. L. (2006). How important are job attitudes? Meta-analytic comparisons of integrative behaviorial outcomes and time sequences. *The Academy of Management Journal, 49*(2), 305-325.

Harrison, M. I., Koppel, R., & Bar-Lev, S. (2007). Unintended consequences of information technologies in health care: An interactive sociotechnical analysis. *Journal of the American Medical Informatics Association, 14*(5), 542-549. doi: 10.1197/jamia.M2384

Harter, J. K., Schmidt, F. L., Agrawal, S., & Plowman, S. K. (2013). *The relationship between engagement at work and organizational outcomes: 2012 Q12 meta analysis*. Washington D.C.: Gallup Organization.

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology, 87*(2), 268-279.

Health care industry. (2013). *U.S. Department of Health and Human Services*. http://www.hhs.gov/

Hennington, A., Janz, B., & Poston, R. (2011). I'm just burned out: Understanding information system compatibility with personal values and role-based stress in a nursing context. *Computers in Human Behavior, 27*(3), 1238-1248. doi: 10.1016/j.chb.2011.01.004

Hersh, W., & Wright, A. (2008). *What workforce is needed to implement the health information technology agenda? Analysis from the HIMSS Analytics database.* Paper presented at the AMIA Symposium, Washington DC.

HIMSS. (2012). Healthcare IT Job Descriptions. from http://www.himss.org/files/HIMSSorg/content/files/201204_JobDescriptionProject.pdf

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist, 44*(3), 513-524. doi: 10.1037/0003-066x.44.3.513

Hobfoll, S. E. (2011). Conservation of resource caravans and engaged settings. *Journal of Occupational & Organizational Psychology, 84*(1), 116-122. doi: 10.1111/j.2044-8325.2010.02016.x

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.

IOM. (2011). To improve patient safety, health information technology needs better oversight, accountability. *Institute of Medicine*. http://www.iom.edu/Reports/2011/Health-IT-and-Patient-Safety-Building-Safer-Systems-for-Better-Care.aspx

Ivancevich, J. M., Napier, H. A., & Wetherbe, J. C. (1985). An empirical study of occupational stress, attitudes and health among information systems personnel. *Information & Management, 9*, 77-85.

Jha, A. K. (2011). The Promise of Electronic Records. *The Journal of the American Medical Association, 306*(8), 880-881. doi: 10.1001/jama.2011.1219

Jha, A. K., DesRoches, C. M., Kralovec, P. D., & Joshi, M. S. (2010). A progress report on electronic health records in U.S. hospitals. *Health Affairs, 29*(10), 1951-1957. doi: 10.1377/hlthaff.2010.0502

Joresborg, K. G., & Sorbom, D. (1993). *LISREL user's reference guide*. Chicago: Scientific Software.

Kahill, S. (1988). Symptoms of professional burnout: A review of empirical evidence. *Canadian Psychology, 29*(3), 284-297.

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal, 33*(4), 692-724. doi: 10.2307/256287

Kahn, W. A. (1992). To be fully there: Psychological presence at work. *Human Relations, 45*(4), 321-349. doi: 10.1177/001872679204500402

Kahn, W. A. (2005). *Holding fast: The struggle to create resilient caregiving organizations*. New York: Brunner-Routledge.

Kahn, W. A. (2007a). Commentary: Positive relationships in groups and communities. In J. E. Dutton & B. R. Ragins (Eds.), *Exploring positive relationships at work* (pp. 277-285). New York: Psychology Press.

Kahn, W. A. (2007b). Meaningful connections: Positive relationships and attachments at work. In J. E. Dutton & B. R. Ragins (Eds.), *Exploring positive relationships at work* (pp. 189-206). New York: Psychology Press.

Kahn, W. A. (2010). The essence of engagement: Lessons from the field. In S. L. Albrecht (Ed.), *Handbook of employee engagement* (pp. 20-30). Cheltenham,UK: Edward Elgar Publishing.

Kahn, W. A. (2013). [Perspectives on engagement: A personal interview with William A. Kahn on February 19, 2013].

Kahn, W. A., & Heaphy, E. D. (2013). Relational contexts of personal engagement at work. In C. Truss, K. Alfes, R. Delbridge, A. Shantz & E. Soane (Eds.), *Employee engagement in theory and practice*. New York: Routledge.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job design. *Administrative Science Quarterly*, *24*, 285-308.

Keenoy, T. (2014). Engagement: A mumuration of objects? In C. Truss, R. Delbridge, K. Alfes, A. Shantz & E. Soane (Eds.), *Employee Engagement in Theory and Practice*. New York: Routledge.

Keeping patients safe: Transforming the work environment of nurses. (2004). *Institute of Medicine*. http://www.iom.edu/Reports/2003/Keeping-Patients-Safe-Transforming-the-Work-Environment-of-Nurses.aspx

King, J., & Adler-Milstein, J. (2013). Hospital progress to meaningful use: Status update. *Health Affairs Blog.* from http://healthaffairs.org/blog/2013/10/15/hospital-progress-to-meaningful-use-status-update/

Kohn, K. T., Corrigan, J. M., & Donaldson, M. S. (1999). *To err Is human: Building a safer health system*. Washington DC: National Academy Press.

Kraha, A., Turner, H., Nimon, K., Zientek, L., & Henson, R. (2012). The mutifaceted concept of predictor importance: Tools to support interpreting multiple regression. *Frontiers in Psychology, 3*(44), 1-16.

Kramer, R. M. (1999). Trust and distrust in organizations: Emerging perspectives, eduring questions. *Annual Review of Psychology, 50*(1), 569-598.

Landers, R. N. (2011). Computing intraclass correlations (ICC) as estimates of interrater reliability in SPSS. from http://neoacademic.com/2011/11//16/computing-intraclass-correlations-icc-as-estimates-of-interrater-reliability-in-spss#.UxNyuDm4Ldk

Laschinger, H. K. S., & Finegan, J. (2005). Empowering nurses for engagement and health in hospital settings. *Journal of Nursing Administration, 35*(10), 439-449.

Laschinger, H. K. S., & Leiter, M. P. (2006). The impact of nursing work environments on patient safety outcomes: The mediating role of burnout/engagement. *Journal of Nursing Administration, 36*(5), 259-267.

Lee, R. T., & Ashforth, B. E. (1996). A meta-analytic examination of the correlates of the three dimensions of burnout. *Journal of Applied Psychology, 81*(2), 123-133.

LeRouge, C., Nelson, A., & Blanton, J. E. (2006). The impact of role stress fit and self-esteem on the job attitudes of IT professionals. *Information & Management, 43*, 928-938.

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*(2), 151-173.

Macey, W., & Schneider, B. (2008). The meaning of employee engagement. *Industrial and Organizational Psychology, 1*, 3-30.

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*(1), 99-128. doi: 10.1207/s15327906mbr3901_4

Mahmood, M. H., Coons, S. J., Guy, M. C., & Pelletier, K. R. (2010). Development and testing of the Workplace Stressors Assessment Questionnaire. *Journal of Occupational and Environmental Medicine, 52*(12), 1192-1200. doi: 10.1097/JOM.0b013e3181fb53dc

Malach-Pines, A. (2005). The Burnout Measure, Short version. *International Journal of Stress Management, 12*(1), 78-88.

Maslach, C. (1976). Burned-out. *Human Behavior, 5*, 16-22.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior, 2*(2), 99-113.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *Maslach burnout inventory manual* (3rd ed.). Palo Alto: Consulting Psychologists Press.

Maslach, C., & Leiter, M. P. (1997). *The truth about burnout*. San Fransisco: Jossey-Bass.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology, 52*, 397-422.

Mathews, A. W. (2011, December 12). The future of U.S. health care, *The Wall Street Journal*.

May, D. R., Gilson, R. L., & Harter, L. M. (2004). The psychological conditions of meaningfulness, safety, and availability and the engagement of the human spirit at work. *Journal of Occupational Psychology, 77*, 11-37.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organzational trust. *Academy of Management Review, 20*(3), 709-734. doi: 10.5465/amr.1995.9509090335

McAllister, D. J. (1995). Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal, 38*(1), 24-69.

McEwen, B. S. (1998). Protective and damaging effects of stress mediators. *Seminars in Medicine of the Beth Israel Deasoness Medical Center, 338*(3), 171-179.

McGrath, J. E. (1970). A conceptual formulation for research on stress. In J. E. McGrath (Ed.), *Social and psychological factors in stress* (pp. 10-21). New York: Renehart & Winston.

McGraw, K. O., & Wong, S. P. (1996). Forming inferences about some intraclass correlation coefficients. *Psychological Methods, 1*(1), 30-46.

Moore, J. E. (2000). One road to turnover: An examination of work exhaustion in technology professionals. *MIS Quarterly, 24*(1), 141-168.

Nahrgang, J. D., Hofmann, D. A., & Morgeson, F. P. (2011). Safety at work: A meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *Journal of Applied Psychology, 96*(1), 71-94.

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): American Psychological Association.

Newman, D. A., Joseph, D. L., & Hulin, C. L. (2010). Job attitudes and employee engagement: Considering the attitude "A-factor". In S. L. Albrecht (Ed.), *The handbook of employee engagement: Perspectives, issues, research, and practice* (pp. 43-61). Northhampton, MA: Edward Elgar.

Newman, D. A., Joseph, D. L., Sparkman, T. E., & Carpenter, N. C. (2011). Invited reaction: The work cognition inventory: Initial evidence of construct validity. *Human Resource Development Quarterly, 22*(1), 37-47.

Nimon, K. (2014). [A Presentation of Scholarly Interests to The University of Texas at Tyler College of Business and Technology on March 28, 2014].

Nimon, K., & Oswald, F. L. (in press). Understanding the results of multiple linear regression: Beyond standardized regression coeeficients. *Organizational Research Methods*.

Nimon, K., Shuck, B., & Zigarmi, D. (2014). *Latent semantic analysis: Examining manifest validity of employee engagement measures.* Paper presented at the 2014 AHRD Conference in the Americas, Houston, TX.

Pfennig, B., & Husch, M. (1994). *Determinants and correlates of the burnout syndrome: A meta-analytic approach*. Unpublised thesis. Freie Universitat Berlin, Psycnologisches Institut.

Pines, A., & Aronson, E. (1988). *Career burnout: Causes and cures*. New York: Free Press.

Podsakoff, P. M., MacKenzie, S. B., Jeong-Yeon, L., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

Preacher, K. J. (2002). Calculation for the test of the difference between two indepedent correlation coeffcients. Retrieved from http://quantpsy.org

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*(4), 717-731. doi: 10.3758/BF03206553

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879-891.

Preacher, K. J., & Leonardelli, G. J. Calculation for the Sobel test. from http://quantpsy.org/sobel/sobel.htm

Press Ganey. (2011). *Hospital Pulse Report*. http://www.pressganey.com/researchResources/hospitals.pulsereports.aspx

Rae-Dupree, J. (2009, February 1). Disruptive innovation, applied to health care, *The New York Times*.

Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects of job performance. *Academy of Management Journal, 53*(3), 617-635. doi: 10.5465/amj.2010.51468988

Robinson, D., Perryman, S., & Hayday, S. (2004). The drivers of employee engagement. Brighton, U.K.: Institute for Employment Studies.

Rogers, L. (2005). Why trust matters: The nurse manager-staff relationship. *Journal of Nursing Administration, 35*(10), 421-423.

Russell, J. A., & Barrett, L. F. (1999). Core affect, prototypical emotional episodes, and other things call emotion: Dissecting the elephant. *Journal of Personality and Social Psychology, 76*(5), 805-819.

Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology, 21*, 600-619.

Saks, A. M. (2008). The meaning and bleeding of employee engagement: How muddy is the water? *Industrial & Organizational Psychology, 1*(1), 40-43. doi: 10.1111/j.1754-9434.2007.00005.x

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior, 25*, 293-315. doi: 10.1002/job.248

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire. *Educational and Psychological Measurement, 66*(4), 701-716. doi: 10.1177/0013164405282471

Schaufeli, W. B., & Buunk, B. P. (2002). Burnout: An overview of 25 years of research and theorizing. In M. J. Schabracq, J. A. M. Winnubst & C. L. Cooper (Eds.), *Handbook of work & health psychology* (2nd ed., pp. 383-425).

Schaufeli, W. B., Enzmann, D., & Girault, N. (1993). Measurement of burnout: A review. *Professional burnout: Recent developments in theory and research*, 199-215.

Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies, 3*(1), 71-92.

Schaufeli, W. B., & van Dierendonck, D. (1993). The construct validity of two burnout measures. *Journal of Organizational Behavior, 14*(7), 631-647.

Schneider, B., Macey, W. H., Barbera, K. M., & Young, S. A. (2010). The role of employee trust in understanding employee engagement. In S. L. Albrecht (Ed.), *Handbook of employee engagement: Perspectives, issues, research and practice*. Northhampton, MA: Edward Elgar.

Schumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling* (3rd ed.). New York: Routledge.

Scott, J. T., Rundall, T. G., Vogt, T. M., & Hsu, J. (2005). Kaiser Permanente's experience of implementing an electronic medical record: a qualitative study. *BMJ, 331*(7528), 1313-1316. doi: 10.1136/bmj.38638.497477.68

Seligman, M. E. P., & Csikszentmihalyi, M. (2001). Positive psychology: An introduction. *American Psychologist, 56*(1), 89-90. doi: 10.1037/0003-066x.56.1.89

Seyle, H. (1946). The general adaptation syndrome and diseases of adaptation. *Journal of Clinical Endocrinology & Metabolism, 6*, 118-135.

Sheng-Pao, S., James, J. J., Gary, K., & Eric, W. (2011). Job burnout of the information technology worker: Work exhaustion, depersonalization, and personal accomplishment. *Information & Management*. doi: 10.1016/j.im.2013.08.003

Shirom, A. (2004). Feeling vigorous at work? The construct of vigor and the study of positive effect in organizations. In D. C. Ganster & P. L. Perrewe (Eds.), *Research in organizational stress and well-being* (Vol. 3). Greenwich, CT: JAI Press.

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin, 86*(2), 420-428. doi: 10.1037/0033-2909.86.2.420

Shuck, B. (2011). Four emerging perspectives of employee engagement: An integrative literature review. *Human Resource Development Review, 10*(3), 304-328. doi: 10.1177/1534484311410840

Shuck, B., Ghosh, R., Zigarmi, D., & Nimon, K. (2012). The jingle jangle of employee engagement: Further exploration of the emerging construct and implications for workplace learning and performance. *Human Resource Development Review, 12*(1), 11-35.

Shuck, B., Nimon, K., & Zigarmi, D. (2013). *Employee engagement and HRD: Philosophical underpinnings, measurement and interventions.* Paper presented at the AHRD International Research Conference in the Americas, Washington D.C.

Shuck, B., & Owen, J. (2013). *Beyond performance on the immediate work task: Exploring the kaleidoscope of employee engagement as a conceptual framework and implications for theory and practice.* Paper presented at the AHRD International Research Conference in the Americas, Washington D.C.

Shuck, B., Reio, T., & Rocco, T. S. (2011). Employee engagement: An examination of antecedant and outcome variables. *Human Resource Development International, 14*(4), 427-445.

Shuck, B., & Reio, T. G. (2011). The employee engagement landscape and HRD: How do we link theory and scholarship to current practice? *Advances in Developing Human Resources, 13*(4), 419.

Shuck, B., Rocco, T. S., & Albornoz, C. A. (2011). Exploring employee engagement from the employee perspective: Implications for HRD. *Journal of European Industrial Training, 35*(4), 300-325.

Shuck, B., & Twyford, D. (2013). *Human resource development and employee engagement: Examining the connection between employee turnover intention.* Paper presented at the AHRD International Research Conference in the Americas, Washington D.C.

Shuck, B., & Wollard, K. (2010). Employee engagement and HRD: A seminal review of the foundations. *Human Resource Development Review, 9*(1), 89-110. doi: 10.1177/1534484309353560

Shuck, B., Zigarmi, D., & Nimon, K. (2014). *Untangling the jangle: Examining the common and unique variance of engagement.* Paper presented at the 2014 AHRD Conference in the Americas, Houston, TX.

Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology, 1*, 27-41.

Sikora, P. B., Beaty, E. D., & Forward, J. (2004). Updating theory on organizational stress: The asynchronous multiple overlapping change (AMOC) model of workplace stress. *Human Resource Development Review, 3*(3), 3-35.

Small, D. C., & Small, R. M. (2011). Patients first! Engaging the hearts and minds of nurses with a patient-centered practice model. *The Online Journal of Issues in Nursing, 16*(2).

Soane, E., Truss, C., Alfes, K., Shantz, A., Rees, C., & Gatenby, M. (2012). Development and application of a new measure of employee engagement: The ISA engagement scale. *Human Resource Development International, 15*(5), 529-547.

Spector, M. D., & Jones, G. E. (2004). Trust in workplace: Factors affecting trust formation between team members. *Journal of Social Psychology, 144*(3), 311-321.

Spector, P. E. (1987). Method variance as an artifact in self-reported affect and perfections at work: Myth or significant problem? *Journal of Applied Psychology, 70*(3), 469-480.

Spielberger, C. D. (1972). *Anxiety: Current trends in theory and research* (Vol. 1 - 2). New York: Academic Press.

Squazzo, J. D. (2011). Creating a culture of engagement. *Healthcare Executive, 26*(6), 18-26.

Stein, G. (2012). Geography and plays (New Edition ed.). Madison: University of Wisconsin Press.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson Education.

Tan, H. H., & Tan, C. S. F. (2000). Toward the differentiation of trust in supervisor and trust in organization. *Genetic, Social & General Psychology Monographs, 126*(2), 241.

Terry, K. (2012). EHRs linked to errors, harm, AMA says *Information Week.* Retrieved March 18, 2012, from http://www.informationweek.com/news/healthcare/EMR/232400325

Truss, C., Delbridge, R., Kerstin, A., Shantz, A., & Soane, E. (Eds.). (2014). *Employee engagement in theory and practice*. New York: Routledge.

Tsai, W., & Ghoshal, S. (1998). Social Capital and value creation: The role of intrafirm networks. *The Academy of Management Journal, 41*(4), 464-476.

Viljevac, A., Cooper-Thomas, H. D., & Saks, A. M. (2012). An investigation into the validity of two measures of work engagement. *International Journal of Human Resource Management, 23*(17), 3692-3709. doi: 10.1080/09585192.2011.639542

Wagner, S. E. (2006). Staff retention: From "satisfied" to "engaged". *Nursing Management, 37*(3), 24-29.

Wynia, M. K., & Classen, D. C. (2011). Improving ambulatory patient safety. *Journal of the American Medical Association, 306*(22), 2504-2505. doi: 10.1001/jama.2011.1820

Young, T. (2010). Keys to understanding EHR adoption. Jumping into EHR technology too early may be painful and costly, but standing on the sidelines could be devastating. *Health Management Technology, 31*(12), 20-22.

Zigarmi, D., Nimon, K., & Shuck, B. (2014). *Employee engagement: Job attitude or mediator between job attitudes and affect?* Paper presented at the 2014 AHRD Conference in the Americas, Houston, TX.

Appendix A: Participant Recruitment Email

DATE

As you know, U.S. hospitals have undergone many changes over the past few years and continue to evolve with changing regulations and imperatives for success. As these efforts continue, an area of particular importance relates to how hospitals create environments in which employees want to come to work, enjoy themselves and feel fulfilled.

To that end, one of my CIO colleagues, Paula Anthony, in conjunction with researchers at The University of Texas at Tyler, developed a web-based survey designed to better understand the perceptions and nuances of the work environment for IT professionals working in hospitals. I have given her approval to conduct this study at HOSPITAL NAME, and I am emailing you to make you aware of the web link that will allow you to complete the survey should you wish to participate.

Your taking part in this web survey is completely voluntary and you may complete it during work hours. Should you choose to participate, your survey responses will be anonymous and only seen by the research team at The University of Texas of Tyler. The survey instrument does not collect any identifying information, and neither I nor Paula nor anyone else will ever know who participates. Paula has assured me that the information she collects will be kept private and used only for the study we are discussing. Further, please note that no incentives are being provided for participation in this survey.

Paula may use the aggregated data to support her research interests through publication or conference venues, but no identifiable characteristics—including the identification of HOSPITAL NAME— will ever be used. However, she does plan to share the summarized results with me and I will share them with you in the hopes they may guide us in creating and sustaining a work environment that can bring out the best in all of HOSPITAL NAME employees.

If you have any questions or concerns, just let me know or direct your questions to Dr. Gloria Duke, The University of Texas at Tyler at (903) 566-7023. If you are interested in participating in this study, please click on the following link by DATE:

WEBLINK

Thank you,
CIO

Appendix B: Informed Consent

The purpose of this research project is to better understand certain aspects of work that may help hospitals create environments in which employees want to come to work, enjoy themselves and feel fulfilled. This is a research project being conducted by Paula Anthony in conjunction with The University of Texas at Tyler. You have been selected to participate in this research project because you are an employee at a hospital or hospital system that has implemented or is currently implementing an electronic health record. In addition, your CIO has approved the inclusion of your hospital or health system in this study.

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

The procedure involves completing an online survey with multiple choice questions about your perceptions of your work. The survey will take about 10-15 minutes to complete. After you read each question or statement, click the button that best corresponds to your response. You may need to scroll down the page to answer all the questions. Click NEXT to continue after each page, and then click DONE when finished. At any time prior to clicking DONE, you can click PREV to go back to a previous page, or EXIT to withdraw.

To protect your confidentiality, your responses will be anonymous and we will not collect identifying information such as your name, department, email address, computer number or IP number. The researcher anticipates no side effects or risks associated with your participation in this study. The results of this study may be shared with The University of Texas at Tyler representatives but will be used only for scholarly purposes. Only a summary of the data will be shared through publication or conference venues.

This research has been reviewed and approved according to The University of Texas at Tyler's Institutional Review Board (IRB) procedures for research involving human subjects. If you have any questions about the research study, please contact Paula Anthony at 903-531-8040 or Gloria Duke, Chair of The University of Tyler IRB, at (903) 566-7023, gduke@uttyler.edu.

ELECTRONIC CONSENT

Clicking on the "Agree" button below indicates that:

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

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

Appendix C: Workplace Stressors Assessment Questionnaire
(Mahmood et al., 2010)

Demands
The number of meetings I must attend interferes with my ability to get the job done.
The demands of work negatively affect my personal relationships outside of work.
It is difficult to unwind at home due to my preoccupations with my job.
I have to do more work than I can do well.
I find it difficult to do my job because of conflicting demands.

Control
I am satisfied with the amount of control I have over my job. (r)
I feel certain about how much authority I have in my job. (r)
Individuals or teams responsible for making decisions have the appropriate authority to implement them. (r)
I have the opportunity to take part in making decisions that affect me. (r)
I have a choice in deciding how I do my work. (r)
My colleagues and I are consulted about change. (r)

Support
If the work gets difficult, my colleagues will help me. (r)
I am given supportive feedback on the work I do. (r)
I can rely on my supervisor to help me out with a work problem. (r)

Role
I am clear about my work goals and objectives for my work group. (r)
I am clear what my duties and responsibilities are at work. (r)

Relationships
There is too much bickering in my work group.
Personality conflicts or strained relationships interfere with my ability to get quality work done.

Rewards
I feel that the work I do is appreciated. (r)
I feel my efforts are rewarded the way they should. (r)
I receive the respect I deserve from my colleagues. (r)
I receive the respect I deserve from my supervisor(s). (r)

Appendix D: Burnout Measure, Short Version
(Malach-Pines, 2005)

When you think about your work overall, how often do you feel the following?

Tired
Disappointed with people
Hopeless
Trapped
Helpless
Depressed
Physically weak/Sickly
Worthless/Like a failure
Difficulties sleeping
"I've had it"

Appendix E: Rich Engagement Scale
(Rich et al., 2010)

Physical
I work with intensity on my job.
I exert my full effort to my job.
I devote a lot of energy to my job.
I try my hardest to perform well on my job.
I strive as hard as I can to complete my job.
I exert a lot of energy on my job.

Emotional
I am enthusiastic about my job.
I feel energetic at my job.
I am interested in my job.
I am proud of my job.
I feel positive about my job.
I am excited about my job.

Cognitive
At work, my mind is focused on my job.
At work, I pay a lot of attention to my job.
At work, I focus a great deal of attention on my job.
At work, I am absorbed by my job.
At work, I concentrate on my job.
At work, I devote a lot of attention to my job.

Appendix F: ISA Engagement Scale
(Soane et al., 2012)

Intellectual
I focus hard on my work.
I concentrate on my work.
I pay a lot of attention to my work.

Social
I share the same work values as my colleagues.
I share the same work goals as my colleagues.
I share the same work attitudes as my colleagues.

Affective
I feel positive about my work.
I feel energetic in my work.
I am enthusiastic in my work.

Appendix G: Co-Worker and Supervisor Trust
(Ferres, 2002)

Co-Worker

I feel I can trust my co-workers to do their jobs well.
I proceed with the knowledge that my co-workers are considerate of my interests.
I believe that my co-workers will support me if I have problems.
Most employees at this organization believe that co-workers are reliable.
I feel confident that my co-workers appreciate my good work.
I feel that my co-workers are truthful in their dealings with me.
I think that my co-workers act reliably from one moment to the next.
I will act on the foundation that my co-workers display ethical behavior.
Most employees at this organization believe that co-workers will be supportive if problems arise.
I believe that my co-workers give me all the information to assist me at work.
Employees at this organization generally feel that co-workers appreciate their good work.
I behave on the basis that my co-workers will not disclose personal information.

Supervisor

I feel that my supervisor listens to what I have to say.
I proceed on the basis that my supervisor will act in good faith.
I act on the basis that my supervisor displays integrity in his/her actions.
I think that my supervisor appreciates additional efforts I make.
I act knowing that my supervisor will keep his/her word.
I believe that my supervisor follows through promises with action.
I feel that my supervisor is available when needed.
I believe that my supervisor keeps personal discussions confidential.
I feel that my supervisor trusts his/her employees to work without excessive supervision.
Employees generally believe that management provides honest answers.
It is frequently acknowledged by employees of this organization that their immediate supervisors reward those who perform well.
Most people at this organization feel comfortable with their immediate supervisors.

Note: This instrument was included in the survey but not considered in this research study. The data collected from it may be used in future research and study.

Appendix H: Oldenburg Burnout Inventory
(Demerouti et al., 2010)

Exhaustion

There are days when I feel tired before I arrive.
After work, I tend to need more time than in the past in order to relax and feel better.
I can tolerate the pressure of my work well. (r)
During my work, I often feel emotionally drained.
After working, I have enough energy for leisure activities. (r)
After my work, I usually feel worn out and weary.
Usually, I can manage the amount of my work well. (r)
When I work, I usually feel energized. (r)

Note: This instrument was included in the survey but not considered in this research study. The data collected from it may be used in future research and study.

Appendix I: Permissions for Use of Measurement Instruments

From: Stephen Joel Coons [SJCoons@c-path.org]
Sent: Monday, May 20, 2013 12:19 PM
To: Anthony, Paula
Subject: RE: Workplace Stressors Assessment Questionnaire

Hi Paula,

I am pleased to grant you permission to use the Workplace Stressors Assessment Questionnaire. I have attached a pdf version of it along with the scoring document.

Best wishes with the development of your proposal and with your Ph.D. dissertation research. I will look forward to receiving information on the results of your study.

SJC

Stephen Joel Coons, PhD
Executive Director, Patient-Reported Outcome Consortium
Critical Path Institute | 1730 East River Road
Tucson, AZ 85718-5893 | (520) 547-3455 Direct | (520) 547-3456 FAX
www.c-path.org

For further assistance, please contact Theresa Swentesky at 520.777.2875 or tswentesky@c-path.org

From: Anthony, Paula
Sent: Saturday, May 18, 2013 3:43 PM
To: Stephen Joel Coons [SJCoons@c-path.org]
Subject: Workplace Stressors Assessment Questionnaire

Dr. Coons -

By way of introduction, I am the CIO of a large healthcare system in Texas and also a Ph.D. student in Organizational Development and Change at The University of Texas at Tyler. I read, with great interest, your 2010 paper in which you and your colleagues developed a new tool for the measurement of workplace stress. I am very interested in the phenomenon of workplace stress and, in particular, its relationship to different operationalizations of employee engagement among technology employees in the healthcare industry.

Currently at the proposal development phase of my Ph.D. journey, I would like to request your permission to use your Workplace Stressors Assessment Questionnaire in my dissertation research study. Of course, I would be happy to send you a copy of my study upon completion and (hopefully!) successful defense. At present, I plan to reach the defense stage by fall of 2014.

If you grant this request, please send me a copy of your actual instrument and scoring method so that I can be sure to retain the reliability of your scale.

Thank you so much for your consideration of my request. I look forward to hearing from you.

From: Natalie Ferres [Natalie.Ferres@bendelta.com]
Sent: Wednesday, November 13, 2013 6:58 PM
To: Anthony, Paula
Subject: Workplace Trust Survey

Paula, hi.

I hope that you are well in Texas.

Please find enclosed a couple of documents that may assist you. There is no manual or official scale as such, but you'll find the questions and original work enclosed in these documents.

Good luck with your research and let me know if you had any questions.

With best regards

Natalie

Dr. Natalie Ferres | Associate Director
Bendelta
www.bendelta.com

From: Anthony, Paula
Sent: Wednesday, November 13, 2013 3:13 PM
To: Natalie.Ferres@bendelta.com
Subject: Workplace Trust Survey

Dr. Ferres -

By way of introduction, I am the CIO of a large healthcare system in Texas and also a Ph.D. student in Organizational Development and Change at The University of Texas at Tyler. I read, with great interest, your paper in which you developed a tool for the measurement of workplace trust. I am very interested in the phenomenon of workplace trust and, in particular, its relationship to different operationalizations of employee engagement among technology employees in the healthcare industry.

I would like to request your permission to use your Workplace Trust Survey in my future research studies. Of course, I would be happy to send you a copy of my study upon completion and publication.

If you grant this request, please send me a copy of your actual instrument and scoring method so that I can be sure to retain the reliability of your scale.

Thank you so much for your consideration of my request. I look forward to hearing from you.

Appendix J: Research Survey Instrument

Survey of IT Professionals Working in U.S. Community Hospitals

Welcome!

Welcome to this survey for IT professionals working in U.S. community hospitals. The first step is to make sure you understand the purpose of this survey and to seek your consent to participate.

1. INFORMED CONSENT

The purpose of this research project is to better understand certain aspects of work that may help hospitals create environments in which employees want to come to work, enjoy themselves and feel fulfilled. This is a research project being conducted by Paula Anthony in conjunction with The University of Texas at Tyler. You have been selected to participate in this research project because you are an employee at a hospital or health system that has implemented or is currently implementing an electronic health record. In addition, your CIO has approved the inclusion of your hospital or health system in this study.

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

The procedure involves completing an online survey with multiple choice questions about your perceptions of your work. The survey will take about 10-15 minutes to complete. After you read each question or statement, click the button that best corresponds to your response. You may need to scroll down the page to answer all the questions. Click NEXT to continue after each page, and then click DONE when finished. At any time prior to clicking DONE, you can click PREV to go back to a previous page, or EXIT to withdraw.

To protect your confidentiality, your responses will be anonymous and we will not collect identifying information such as your name, department, email address, computer number or IP number. The researcher anticipates no side effects or risks associated with your participation in this study. The results of this study may be shared with The University of Texas at Tyler representatives but will be used only for scholarly purposes. Only a summary of the data will be shared through publication or conference venues.

Page 1

Survey of IT Professionals Working in U.S. Community Hospitals

This research has been reviewed and approved according to The University of Texas at Tyler's Institutional Review Board (IRB) procedures for research involving human subjects. If you have any questions about the research study, please contact Paula Anthony at 903-531-8040 or Gloria Duke, Chair of the The University of Tyler IRB, at (903) 566-7023, gduke@uttyler.edu.

ELECTRONIC CONSENT: Please select your choice below.

Clicking on the "Agree" button below indicates that:

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

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

◯ Agree

◯ Disagree

Please choose a response to each of the following questions that best matches how you feel about your job. Remember, be honest - there are no right or wrong answers. Often, the best approach is to select the first response that comes to your mind.

1. I work with intensity on my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

2. I exert my full effort to my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
◯	◯	◯	◯	◯

3. I devote a lot of energy to my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
◯	◯	◯	◯	◯

4. I try my hardest to perform well on my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
◯	◯	◯	◯	◯

Page 2

Survey of IT Professionals Working in U.S. Community Hospitals

5. I strive as hard as I can to complete my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
◯	◯	◯	◯	◯

6. I exert a lot of energy on my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

7. I am enthusiastic about my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

8. I feel energetic at my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

9. I am interested in my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

10. I am proud of my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

11. I feel positive about my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

12. I am excited about my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

13. At work, my mind is focused on my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

14. At work, I pay a lot of attention to my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

15. At work, I focus a great deal of attention on my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

Survey of IT Professionals Working in U.S. Community Hospitals

16. At work, I am absorbed by my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

17. At work, I concentrate on my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

18. At work, I devote a lot of attention to my job.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
◯	◯	◯	◯	◯

Again, please provide the response that best describes you and your work.

1. I focus hard on my work.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

2. I concentrate on my work.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

3. I pay a lot of attention to my work.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

4. I share the same work values as my colleagues.

Strongly disagree	Disagree	Somewaht disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

5. I share the same work goals as my colleagues.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

6. I share the same work attitudes as my colleagues.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

Page 4

Survey of IT Professionals Working in U.S. Community Hospitals

7. I feel positive about my work.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

8. I feel energetic in my work.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

9. I am enthusiastic in my work.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

There are 10 questions in this section. Please use the scale to answer the following questions.

1. When you think about your work overall, how often do you feel tired?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

2. When you think about your work overall, how often do you feel disappointed with people?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

3. When you think about your work overall, how often do you feel hopeless?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

4. When you think about your work overall, how often do you feel trapped?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

5. When you think about your work overall, how often do you feel helpless?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

6. When you think about your work overall, how often do you feel depressed?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

Page 5

Survey of IT Professionals Working in U.S. Community Hospitals

7. When you think about your work overall, how often do you feel physically weak/sickly?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

8. When you think about your work overall, how often do you feel worthless/like a failure?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

9. When you think about your work overall, how often do you have difficulties sleeping?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

10. When you think about your work overall, how often do you feel like "I've had it"?

Never	Almost never	Rarely	Sometimes	Often	Very often	Always
◯	◯	◯	◯	◯	◯	◯

Please indicate how you feel about each of the following statements by clicking on circle that best represents your response. Be sure to note that the responses have changed (again) and will change (yet again!) about half way through this section.

1. The number of meetings I must attend interferes with my ability to get the job done.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
◯	◯	◯	◯	◯

2. The demands of work negatively affect my personal relationships outside of work.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
◯	◯	◯	◯	◯

3. It is difficult to unwind at home due to my preoccupation with my job.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
◯	◯	◯	◯	◯

4. I am satisfied with the amount of control I have over my job.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
◯	◯	◯	◯	◯

5. I feel certain about how much authority I have in my job.

Strongly agree	Agree	Neither agree	Disagree	Strongly disagree
◯	◯	◯	◯	◯

Page 6

Survey of IT Professionals Working in U.S. Community Hospitals

6. Individuals or teams responsible for making decisions have the appropriate authority to implement them.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

7. I have the opportunity to take part in making decisions that affect me.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

8. I have a choice in deciding how I do my work.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

9. I am clear about the goals and objectives for my work group.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

10. I am clear what my duties and responsibilities are at work.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

11. My colleagues and I are consulted about change at work.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

12. I feel the work I do is appreciated.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

13. I feel my efforts are rewarded the way they should be.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

14. I receive the respect I deserve from my colleagues.

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

15. I receive the respect I deserve from my supervisor(s).

Strongly agree ○ | Agree ○ | Neither agree nor disagree ○ | Disagree ○ | Strongly disagree ○

16. I have to do more work than I can do well.

Never ○ | Seldom ○ | Sometimes ○ | Often ○ | Always ○

Survey of IT Professionals Working in U.S. Community Hospitals

17. I find it difficult to do my job because of conflicting job demands.

Never ○ Seldom ○ Somtimes ○ Often ○ Always ○

18. If the work gets difficult, my colleagues will help me.

Never ○ Seldom ○ Sometimes ○ Often ○ Always ○

19. I am given supportive feedback on the work I do.

Never ○ Seldom ○ Sometimes ○ Often ○ Always ○

20. I can rely on my supervisor to help me out with a work problem.

Never ○ Seldom ○ Sometimes ○ Often ○ Always ○

21. There is too much bickering in my work group.

Never ○ Seldom ○ Sometimes ○ Often ○ Always ○

22. Personality conflicts or strained relationships interfere with my ability to get quality work done.

Never ○ Seldom ○ Sometimes ○ Often ○ Always ○

12 questions on this page, and the possible responses have changed yet again.

1. I feel I can trust my co-workers to do their jobs well.

Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neither agree nor disagree ○ Somewhat agree ○ Agree ○ Strongly agree ○

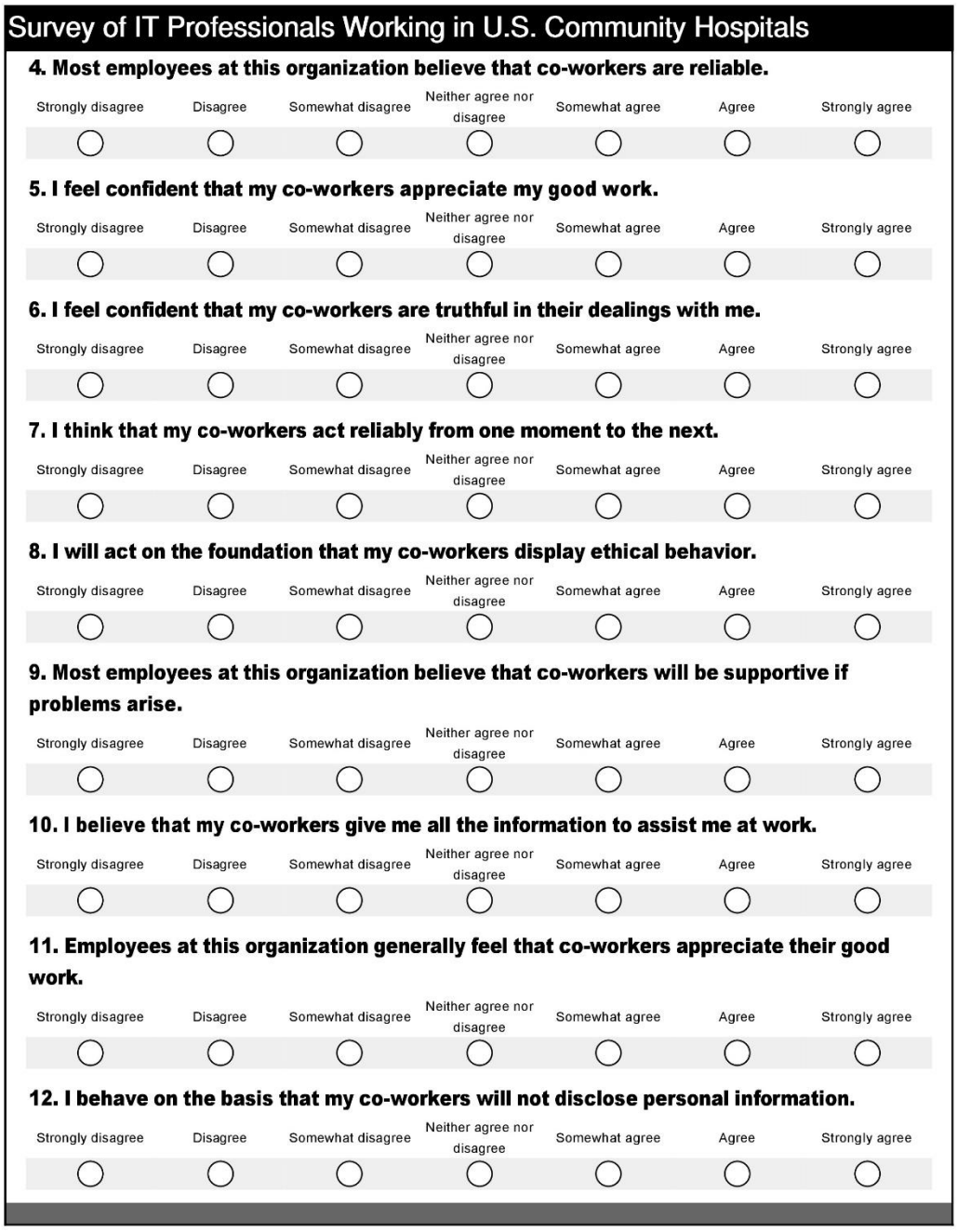
2. I proceed with the knowledge that my co-workers are considerate of my interests.

Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neither agree nor disagree ○ Somewhat agree ○ Agree ○ Strongly agree ○

3. I believe that my co-workers support me if I have problems.

Strongly disagree ○ Disagree ○ Somewhat disagree ○ Neither agree nor disagree ○ Somewhat agree ○ Agree ○ Strongly agree ○

Page 8



Survey of IT Professionals Working in U.S. Community Hospitals

4. Most employees at this organization believe that co-workers are reliable.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

5. I feel confident that my co-workers appreciate my good work.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

6. I feel confident that my co-workers are truthful in their dealings with me.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

7. I think that my co-workers act reliably from one moment to the next.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

8. I will act on the foundation that my co-workers display ethical behavior.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

9. Most employees at this organization believe that co-workers will be supportive if problems arise.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

10. I believe that my co-workers give me all the information to assist me at work.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

11. Employees at this organization generally feel that co-workers appreciate their good work.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

12. I behave on the basis that my co-workers will not disclose personal information.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

Page 9

Survey of IT Professionals Working in U.S. Community Hospitals

12 questions on this page. Almost done!

1. I feel that my supervisor listens to what I have to say.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

2. I proceed on the basis that my supervisor will act in good faith.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

3. I act on the basis that my supervisor displays integrity in his/her actions.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

4. I think that my supervisor appreciates additional efforts I make.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

5. I act knowing that my supervisor will keep his/her word.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

6. I believe that my supervisor follows through promises with action.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

7. I feel that my supervisor is available when needed.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

8. I believe that my supervisor keeps personal discussions confidential.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

Page 10

Survey of IT Professionals Working in U.S. Community Hospitals

9. I feel that my supervisor trusts his/her employees to work without excessive supervision.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

10. Employees generally believe that management provides honest answers.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

11. It is frequently acknowledged by employees at this organization that their immediate supervisors reward those who perform well.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

12. Most people at this organization feel comfortable with their immediate supervisors.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
◯	◯	◯	◯	◯	◯	◯

These are the last 8 opinion questions ... and your answers can range from "strongly agree" to "strongly disagree".

1. There are days when I feel tired before I arrive.

Strongly agree	Agree	Disagree	Strongly disagree
◯	◯	◯	◯

2. After work, I tend to need more time than in the past in order to relax and feel better.

Strongly agree	Agree	Disagree	Strongly disagree
◯	◯	◯	◯

3. I can tolerate the pressure of my work well.

Strongly agree	Agree	Disagree	Strongly disagree
◯	◯	◯	◯

4. During my work, I often feel emotionally drained.

Strongly agree	Agree	Disagree	Strongly disagree
◯	◯	◯	◯

5. After working, I have enough energy for leisure activities.

Strongly agree	Agree	Disagree	Strongly disagree
◯	◯	◯	◯

Page 11

Survey of IT Professionals Working in U.S. Community Hospitals

6. After my work, I usually feel worn out and weary.

Strongly agree	Agree	Disagree	Strongly disagree
◯	◯	◯	◯

7. Usually, I can manage the amount of my work well.

Strongly agree	Agree	Disagree	Strongly disagree
◯	◯	◯	◯

8. When I work, I usually feel energized.

Strongly agree	Agree	Disagree	Strongly disagree
◯	◯	◯	◯

Down to the last questions!

Please answer the following general questions about yourself. Remember, none of this information is tied to your identity.

1. What is your gender?

◯ Female

◯ Male

2. What is your age?

Years _____

3. How many years have you worked for your current employer?

Years _____

4. How many years have you worked as an IT professional in healthcare?

Years _____

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

◯ Did not graduate from high school

◯ Graduated from high school

◯ Attended college

◯ Graduated from college

◯ Attended graduate school

◯ Received a graduate degree

Page 12

Survey of IT Professionals Working in U.S. Community Hospitals

6. Choose the answer that best describes your job.

- ◯ I primarily work with end-users face-to-face.
- ◯ I primarily work with end-users over the telephone.
- ◯ I work with end-users both face-to-face and over the telephone.
- ◯ I sometimes work with end-users.
- ◯ I rarely (or never) work directly with end-users.

7. Choose the answer that best describes job title or position.

- ◯ Hardware technician
- ◯ Network administrator
- ◯ Software analyst
- ◯ System analyst
- ◯ System engineer
- ◯ Data/system architect
- ◯ Software engineer
- ◯ Programmer
- ◯ Database administrator
- ◯ Project manager
- ◯ Clinical informaticist
- ◯ Help desk technician
- ◯ Other

8. Do you supervise or manage other employees?

- ◯ Yes
- ◯ No

Survey of IT Professionals Working in U.S. Community Hospitals

9. Which hospital electronic health record (EHR) do you (or does your organization) work with most?

- ◯ Allscripts
- ◯ Cerner
- ◯ CPSI
- ◯ Epic
- ◯ GE Centricity
- ◯ McKesson Horizon
- ◯ Meditech
- ◯ MedSeries4 Clinicals
- ◯ Siemens Invision
- ◯ Siemens Soarian
- ◯ Other

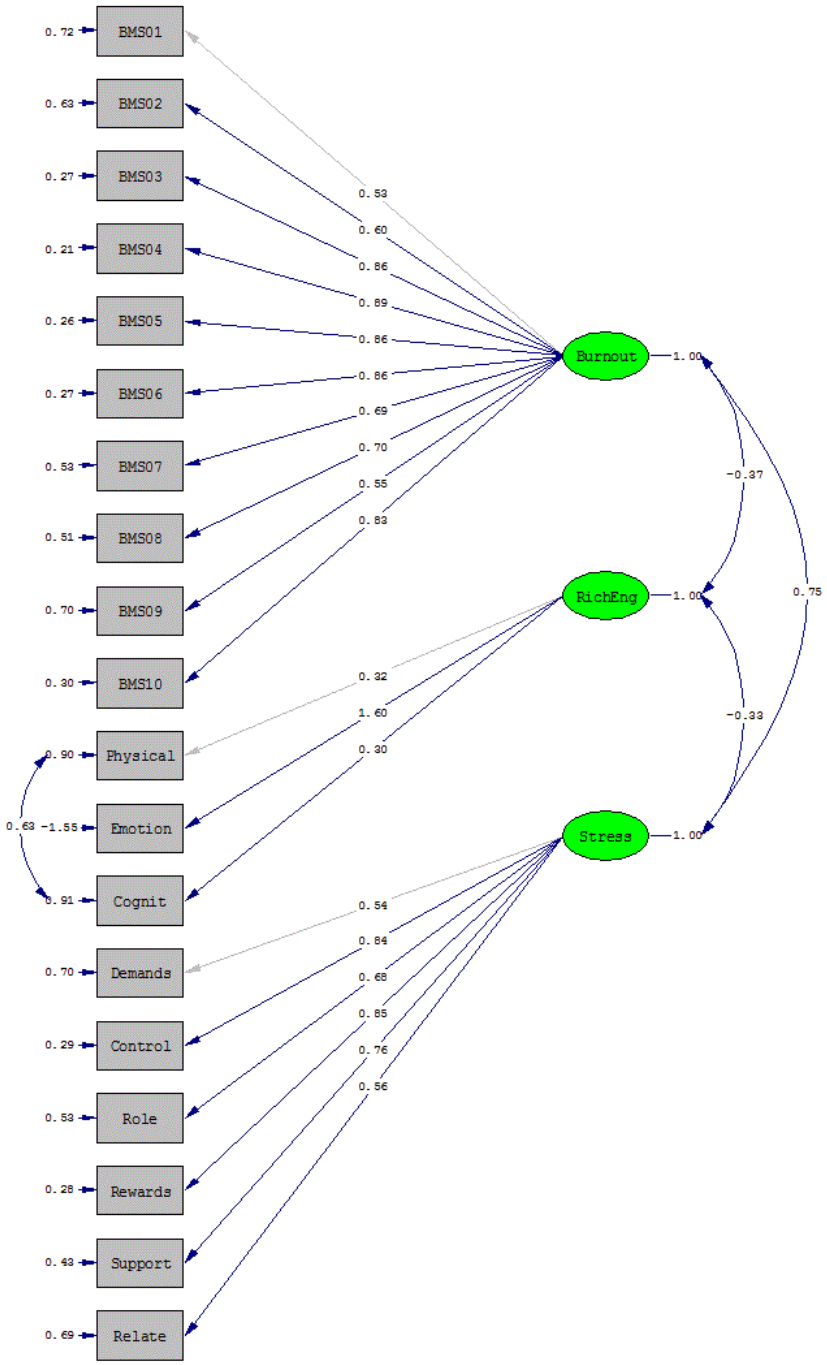
Finished!

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

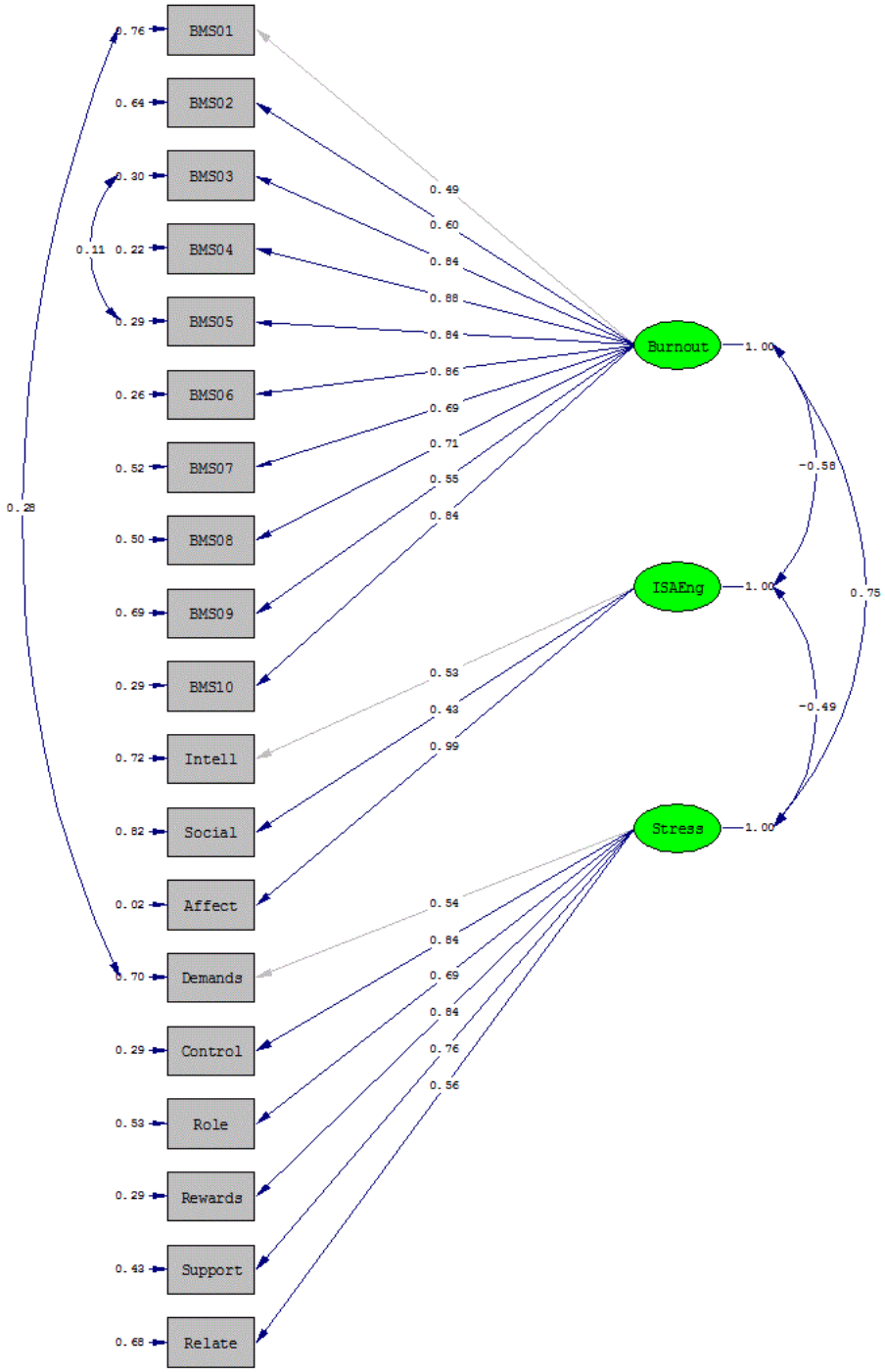
Page 14

Appendix K: Measurement Models

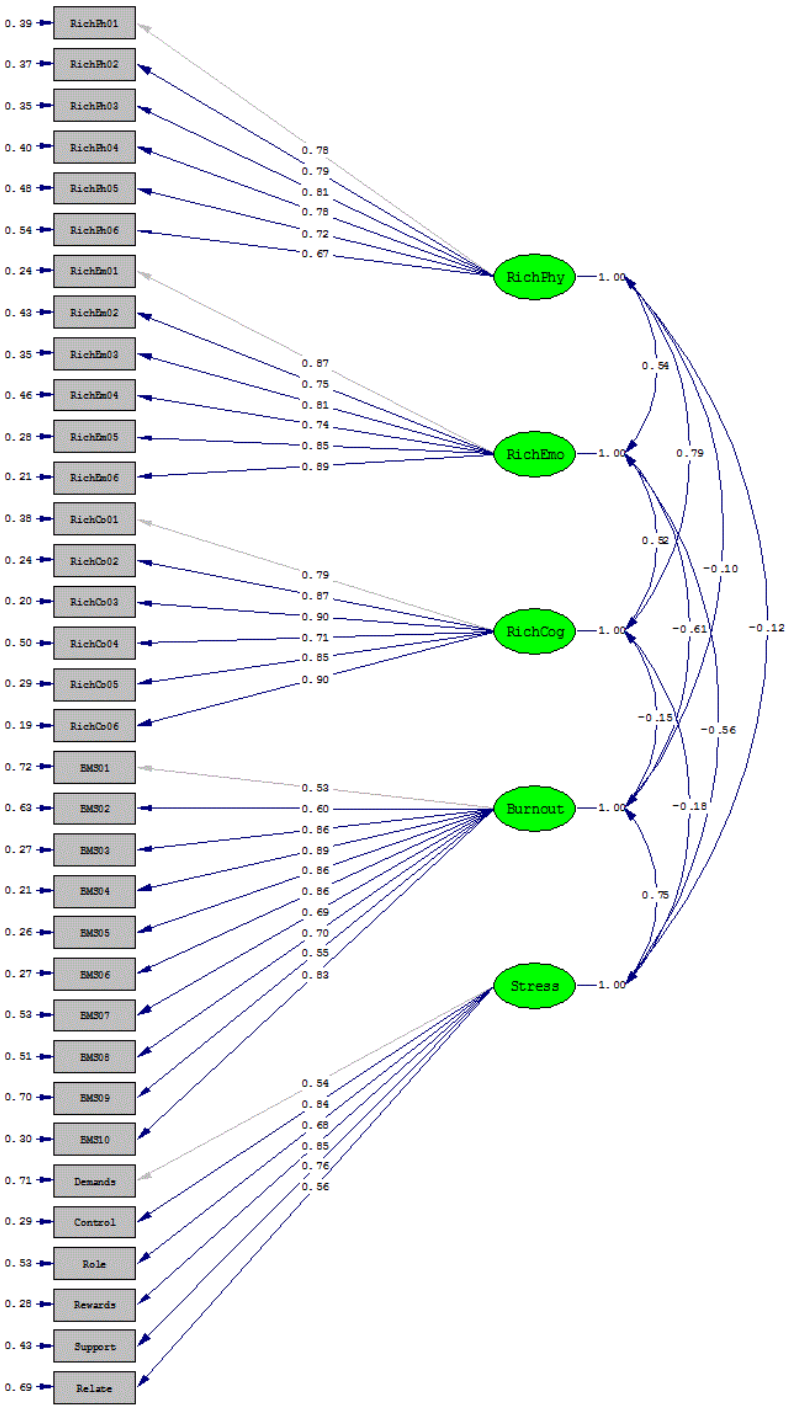
Workplace Stress, Burnout and Employee Engagement (Rich Overall Scale)
Standardized factor loadings; all significant with *t*-values>|1.96|



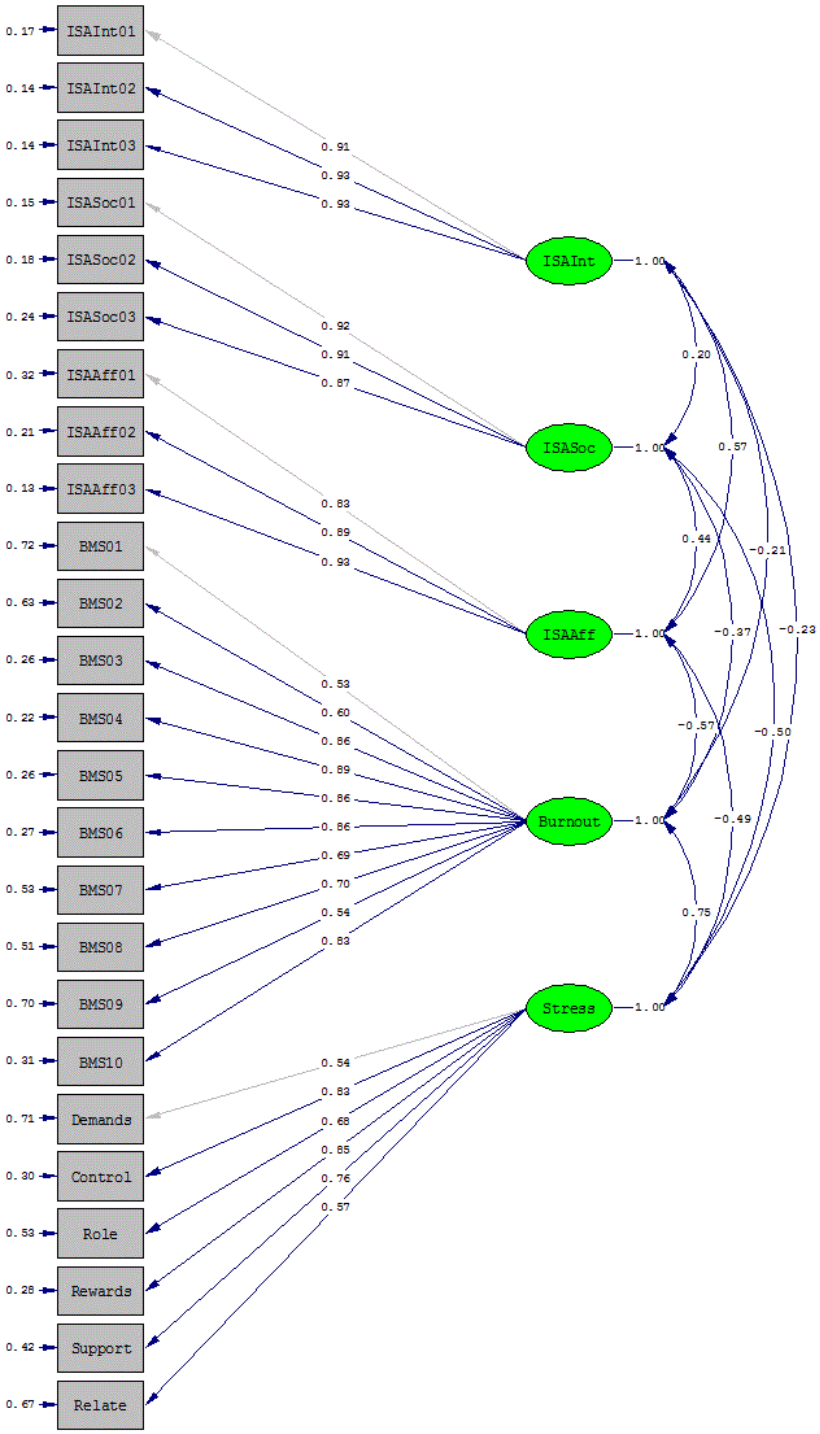
Workplace Stress, Burnout and Employee Engagement (ISA Overall Scale)
Standardized factor loadings; all significant with *t*-values>|1.96|



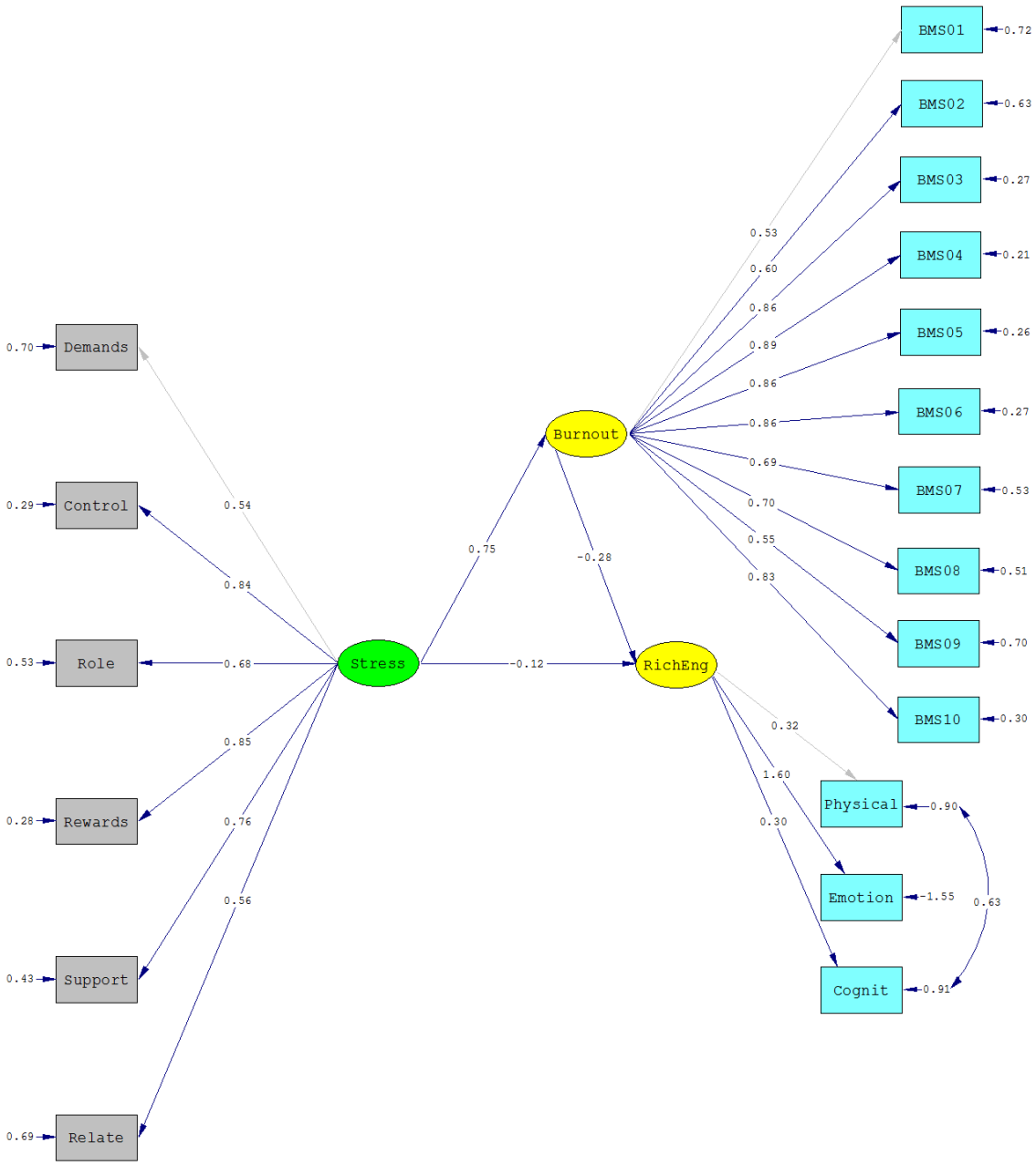
Workplace Stress, Burnout and Employee Engagement (Rich Subscales)
Standardized factor loadings; all significant with *t*-values>|1.96|



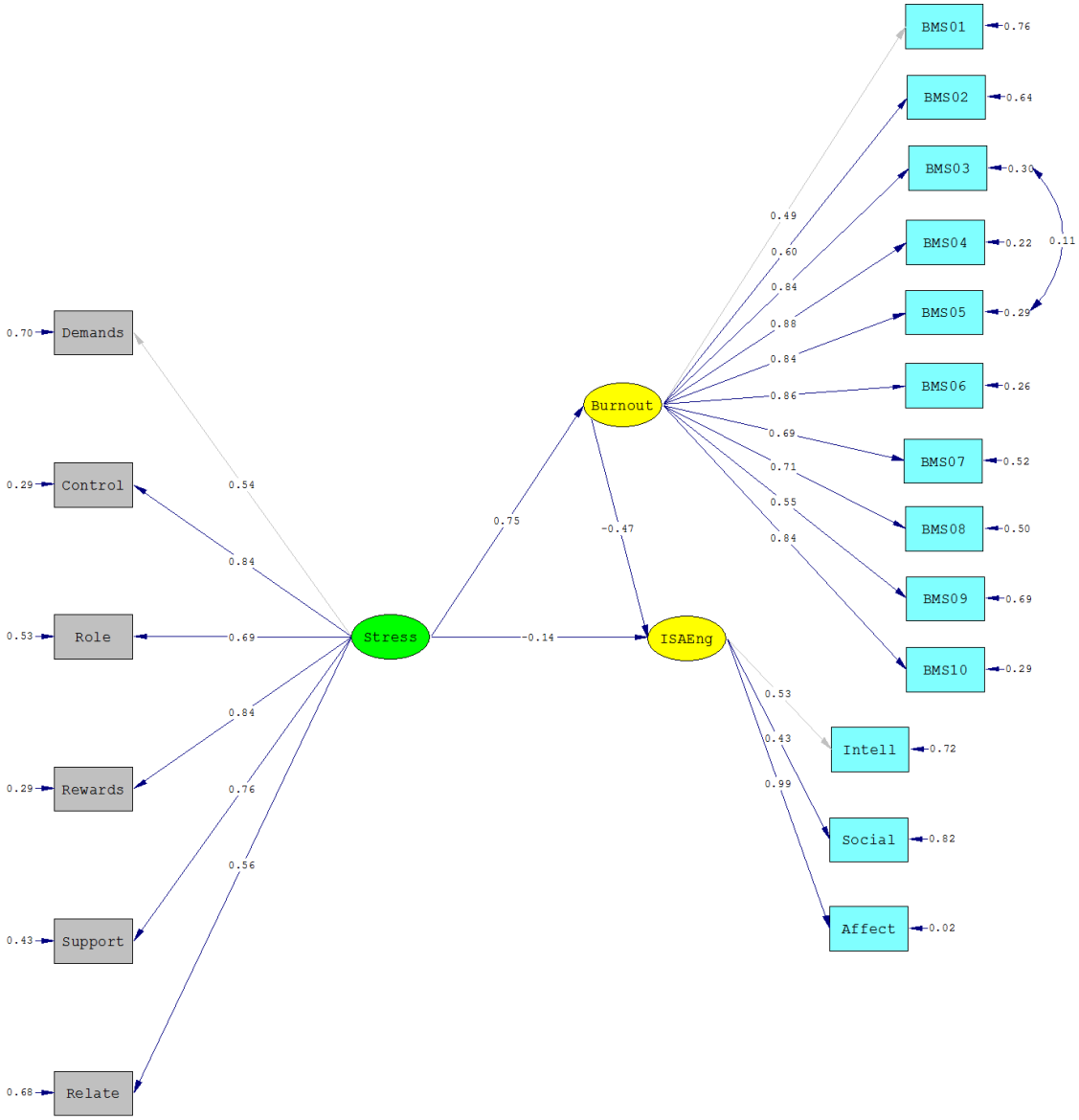
Workplace Stress, Burnout and Employee Engagement (ISA Subscales)
Standardized factor loadings; all significant with *t*-values>|1.96|



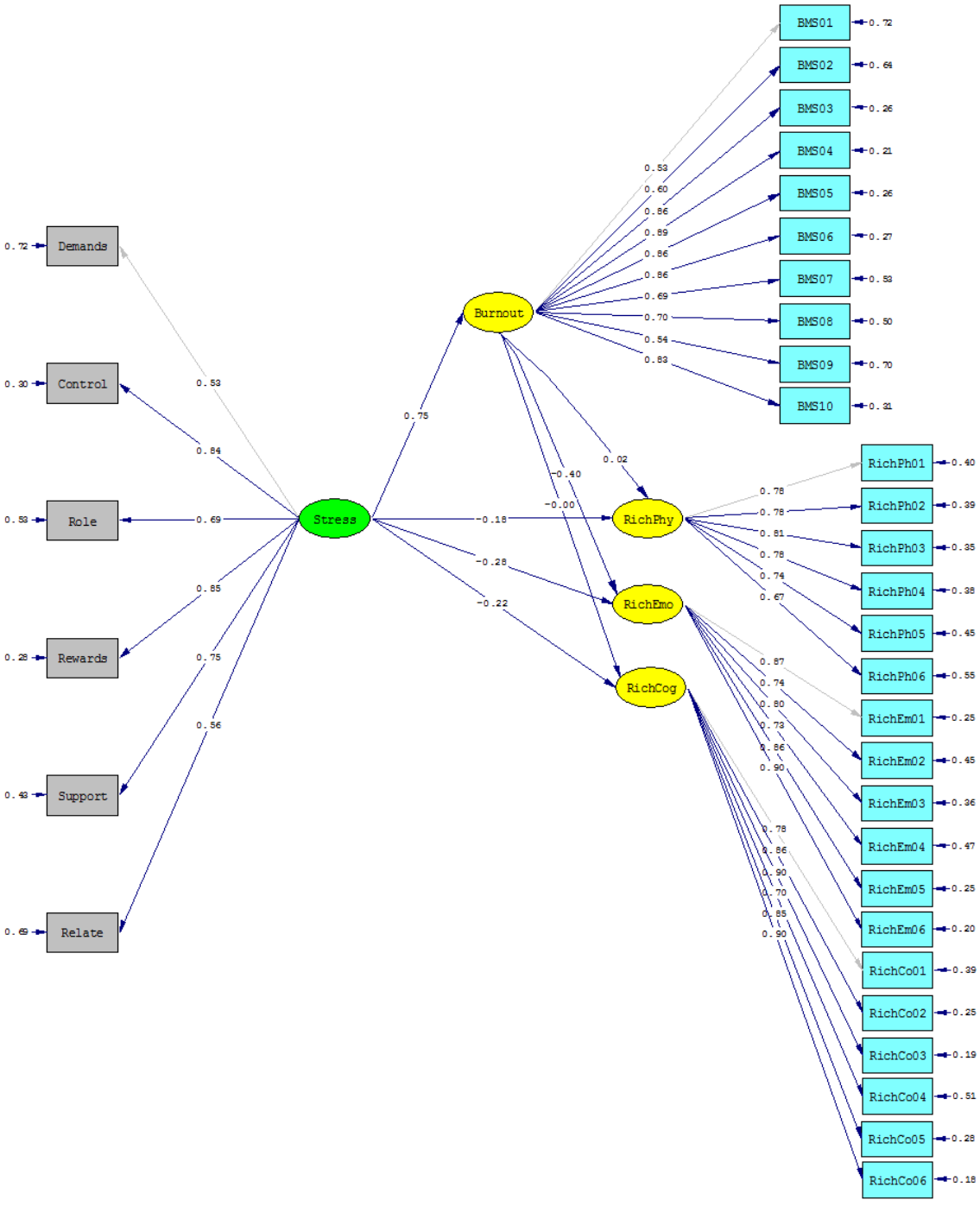
Workplace Stress, Burnout and Employee Engagement (Rich Overall Scale)
Standardized Path Coefficients



Workplace Stress, Burnout and Employee Engagement (ISA Overall Scale)
Standardized Path Coefficients



Workplace Stress, Burnout and Employee Engagement (Rich Subscales)
Standardized Path Coefficients



Workplace Stress, Burnout and Employee Engagement (ISA Subscales)
Standardized Path Coefficients