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# Investigating Employee Engagement through a Self-Determination Theory Framework

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INVESTIGATING EMPLOYEE ENGAGEMENT WITHIN A  
SELF-DETERMINATION THEORY FRAMEWORK

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A Thesis  
Presented to  
the Graduate School of  
Clemson University

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science  
Applied Psychology

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by  
Crystal S. Wiedemann  
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## ABSTRACT

Over the last decade, the concept of employee engagement has attracted substantial attention in both research settings and organizational applications (Christian, Garza, & Slaughter, 2011). Research has shown employee engagement to be related to several positive organizational outcomes, including employee production, employee retention, customer satisfaction and company profit (Harter, Schmidt, & Hayes, 2002; Hewitt Associates LLC, 2005). While there has been a recent surge of academic interest in employee engagement, there remains much to be learned about its antecedents. This study investigates employee engagement within the more established motivational framework of Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2000) as proposed by Meyer and Gagne (2008) to determine if satisfying the needs of competence, autonomy, and relatedness through the work environment is associated with increased levels of employee engagement and well-being. This study also examines the underlying need satisfaction mechanism in detail using a computational modeling approach. Three competing models were tested and the "ramp" model, conceptually similar to Herzberg's original formulation of job satisfaction/dissatisfaction (1959), best predicted levels of employee engagement in a sample of employees from a large southeastern public university.

*Keywords:* self-determination theory, employee engagement, autonomous motivation

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## CHAPTER ONE

### INTRODUCTION

Employee engagement, a work motivation construct developed by Kahn (1990), is currently a hot topic in both the business and academic communities (Vance, 2006; Macey & Schneider, 2008). Due to increasing economic pressures over the last decade, many businesses have felt the strain on their budgets, and likewise, their workforces. In an effort to gain strategic advantage, or even just maintain performance, more and more companies are looking to derive all they can from their employees. Increasing employee engagement has become a popular management strategy among business leaders as research has linked engagement with several positive organizational outcomes to include not only employee loyalty and production, but also customer satisfaction and profit (Harter et al., 2002; Hewitt Associates LLC, 2005; Harter, Schmidt, Kilham, & Asplund, 2006). Research has long supported the connection between job attitudes and the health of employees (e.g. Warr, Cook, & Wall, 1979), but now with employee engagement showing itself to be connected to the health of companies, engagement improvement initiatives have been spurred worldwide. The Gallup Corporation, just one supplier of an employee engagement assessment, has recorded over 25 million responses to its survey from 2.8 million workgroups in 195 different countries (Gallup, 2013).

In the academic community, employee engagement is also a hot topic largely due to the controversy it has conjured up. Debate surrounds the construct's definition, measurement, and antecedents (Macey & Schneider, 2008). When first introduced, many researchers argued that employee engagement was nothing more than a new term for

older already established constructs, like job satisfaction, job involvement, or organizational commitment (Newman & Harrison, 2008). But research by Rich, LePine, and Crawford (2010) found employee engagement to explain variations in job performance above and beyond the job attitudes of job involvement, job satisfaction, intrinsic motivation, and organizational commitment. Substantial research efforts are now helping to alleviate the ambiguity surrounding the construct (e.g. Macey & Schneider, 2008; Rich et al., 2010, Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002), but much more is needed before many of the common employee engagement initiatives are truly capable of producing the results they are intended to create (Wagner, 2015).

One of the major obstacles hindering the employee engagement construct may be the lack of a robust theoretical framework in which to guide research and practice (Meyer & Gagne, 2008). According to Meyer and Gagne, the employee engagement construct overlaps significantly with autonomous motivation as defined by Self-Determination Theory (Deci & Ryan, 1985), or SDT, and intuitively fits within the SDT framework. SDT is a theory of motivation which suggests that optimal human functioning arises from the satisfaction of the three basic human needs of competence, autonomy, and relatedness (Ryan & Deci, 2000). By grounding employee engagement in Self-Determination Theory as an outcome of SDT need satisfaction, the employee engagement construct would benefit from a large body of research on motivation. SDT need satisfaction has been shown to be connected to psychological well-being and a multitude of positive work

outcomes to include motivation, performance, job satisfaction, retention, organizational commitment, and trust in management (Gagne & Deci, 2005).

In addition to examining the relationship between SDT need satisfaction and employee engagement, this study also takes a detailed look at the nature of the underlying need satisfaction mechanism itself. It is typically assumed in SDT research that linear increases in need satisfaction result in linear increases in outcomes, but this assumption has not been fully investigated. This study explores whether the linear model is indeed the most accurate way to represent SDT need satisfaction.

### **Purpose**

The overall purpose of this paper was to investigate the relationship between Self-Determination Theory (Ryan & Deci, 2000) and employee engagement (Kahn, 1990) as proposed by Meyer and Gagne (2008). This study examined whether satisfying the needs for competence, autonomy, and relatedness through the work environment predicted increases in employee engagement and well-being. Additionally, a major aim of this study was to determine if the underlying need satisfaction mechanism is best represented as a linear function, step function, or ramp function.

## CHAPTER TWO

### EMPLOYEE ENGAGEMENT

So what is employee engagement? Despite being a very popular business concept, the employee engagement construct lacks a clear definition (Macey & Schneider, 2008). There are many different approaches to the study of employee engagement among scholars and practitioners, each with their own definitions and measures. This paper will discuss three of the most prevalent approaches to the study of engagement among scholars to include Kahn's (1990) approach, engagement as the opposite of burnout (Maslach, 2001), and satisfaction-engagement (Harter et al., 2002). This paper will then explore the consideration of a new framework, SDT-engagement as proposed by Meyer and Gagne (2008).

#### **Kahn (1990)**

Kahn (1990), who is credited with originally conceptualizing the construct, viewed employee engagement as a motivational variable spanning the intrinsic and extrinsic continuum (Shuck, 2011). In his interviews with camp counselors and financial professionals about their work experiences, Kahn examined the relationship between various aspects of the work environment and the workers' level of personal involvement in their work tasks. In Kahn's article titled "Psychological Conditions of Personal Engagement and Disengagement at Work," he defined employee engagement as "the harnessing of organizational member's selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances" (Kahn, 1990, p. 694).

Kahn's conceptualization of employee engagement, however, has significant measurement challenges due to the comprehensive nature of what Kahn described as employing the member's "whole self" into the work role (Kahn, 1990, p. 692). Although difficult to operationalize, Kahn's conceptualization of employee engagement has remained the most frequently cited definition (Rich et al, 2010). Resurgent academic interest in employee engagement though, has started to lead scholars back to the empirical study of Kahn's conceptualization of employee engagement as a motivational concept (May et al., 2004; Rich et al., 2010, Shuck, 2010).

### **Opposite of Burnout**

Probably the most widely used measure of engagement by scholars, the Utrecht Work Engagement Scale (UWES), comes from Schaufeli et al., (2002) who define engagement as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (p.74). This definition arose from the burnout literature, as engagement was conceptualized as being the opposite of burnout, which was defined by exhaustion, cynicism, and ineffectiveness (Maslach, 2001). To better understand the antecedents of burnout, the Job-Demands & Resources (JD-R) Model was developed by Demerouti, Bakker, Nachreiner, Schaufeli (2001). Then engagement was added to the JD-R model (Bakker, Demerouti, Verbeke, 2004), where burnout and work engagement were depicted as opposite outcomes of the interaction between job demands and resources.

Although it continues to be a popular framework in which to investigate engagement, recent criticisms of the JD-R model have questioned the model's accuracy

in representing the motivational process (Schaufeli & Taris, 2014). Most of the studies using the JD-R model have failed to find a significant relationship between job demands and engagement. “It is an empirical fact that the relation between job demands and engagement is usually not statistically significant, but occasionally it may also be positive or negative” (Schaufeli & Taris, 2014, p.56). One explanation for this finding comes from the distinction made by Cavanaugh, Boswell, Roehling, and Boudreau (2000) between “challenge” and “hindrance” demands. Challenge demands, such as high workload, time pressure, responsibility, and job scope are stressors within the work environment that may actually be motivational because they can encourage personal growth. Whereas hindrance demands, such as organizational politics, “red tape,” job insecurity, and role ambiguity are stressors within the work environment that are demotivational because they are typically viewed as unnecessary obstacles to growth and goal attainment. After accounting for type of demand, whether challenge or hindrance, research conducted by Crawford, LePine, and Rich (2010) found the relationship between demands and engagement to be statistically significant. Their study demonstrated that a hindrance demand negatively impacts engagement, whereas, a challenge demand has a motivational effect and thus increases engagement.

Thus, using the JD-R model to investigate employee engagement may be problematic for several reasons. First, it is necessary to categorize demands appropriately into challenges and hindrances, as mentioned earlier. Second, not only could some demands be motivational, but some resources could be viewed as threats (e.g. too much job control). Third, how much of a resource is too much, or which demands are

challenging or hindering, is often a matter of personal opinion (i.e. a function of appraisal). So when using the JD-R model to investigate engagement, researchers may need to consider individual appraisals of specific demands and resources. Positively appraised demands may need to be categorized as a resource and negatively appraised resources may need to be categorized as a demand, in order to accurately model the motivational process (Schaufeli & Taris, 2014).

### **Satisfaction-engagement**

The Gallup Q-12 survey, perhaps the most widely used assessment in applied settings, measures 12 facets of job satisfaction which are suggested to be indicators of employee engagement, or antecedents, but the assessment does not measure employee engagement directly. The Gallup organization defines employee engagement as “the individual’s involvement and satisfaction with as well as enthusiasm for work” (Harter et al., 2002, p. 269). One of the main distinctions between job satisfaction and employee engagement, however, is that higher levels of job satisfaction usually indicate satiation or contentment, whereas higher levels of employee engagement are thought to indicate activation and high levels of energy. This helps to explain why research has shown employee engagement to not only be related to in-role performance, but extra-role performance as well (Rich et al., 2010; Inceoglu & Fleck, 2010).

### **Employee Engagement Versus Other Job Attitudes**

Job involvement has been compared to employee engagement as having a similar conceptualization (Schohat & Vigoda-Gadot, 2010). Job involvement is described as the degree to which a person’s sense of esteem is affected by their job performance and how

much their self-image is tied to their job (Lawyer & Hall, 1970; Kanungo, 1982).

Employee engagement, on the other hand, speaks of investing one's whole self, or all of their capabilities and capacities, into the job role and is not a measure of self-image or the amount of importance one places on work that constitutes self-identity. Some have argued that job involvement would be more accurately characterized as an independent variable or considered an individual difference, more so than an interaction with the work environment as is the case with employee engagement (Hallberg & Schaufeli, 2006).

Some researchers believe the concept of employee engagement to be similar to organizational commitment (Wellins & Concellman, 2005). Measures of organizational commitment from Meyer and Allen (1997) and Mowday, Porter, and Steers (1982) describe feelings of belongingness, personal meaning, effort, and pride, which seem to be similar to elements of employee engagement (Macey & Schneider, 2008). Hallberg and Schaufeli, 2006, distinguish organizational commitment from employee engagement by noting how an individual's level of organizational commitment appears to be more dependent on extrinsic factors in the organization and less dependent on the individual or their intrinsic motivation, which is not the case with employee engagement.

### **Trait, State, or Behavior?**

Some confusion exists as to whether employee engagement is a trait, state, or behavior (Macey & Schneider, 2008). The most widely accepted version of employee engagement among researchers is of a psychological state, or the feelings and attitudes toward work that are influenced by the job and the work environment. In practice, however, the appeal of employee engagement has been in terms of the behavioral

outcomes, or behavioral engagement, which is thought to be connected to organizational effectiveness. Behavioral engagement is often thought of as discretionary effort (Towers-Perrin, 2003) or organizational citizenship behavior (Organ, 1997). There is also some evidence for the notion that certain individual differences could be attributed to an inclination toward employee engagement, such as proactive personality (Crant, 2000), positive affect, and conscientiousness. These differences are what have been referred to as trait employee engagement (Macey & Schneider, 2008).

This study focuses on employee engagement as a psychological state, as this is the most widely accepted view of the construct. This is also congruent with Kahn's (1990) early conceptualization of employee engagement as a motivational variable. Although, this perspective of employee engagement as a motivational construct has been somewhat neglected in the academic literature until recently (Rich et al., 2010). This was even acknowledged by Macey and Schneider (2008) who have provided the most comprehensive review of employee engagement to date, "we leave the chore of integrating engagement with 'motivation' to others" (p. 4).

Kahn's early conceptualization of employee engagement was that of a motivational construct spanning the intrinsic and extrinsic continuum (Shuck, 2011). One of the reasons that employee engagement has not been well integrated into the study of motivation, may be that researchers could not find an adequate fit within motivational theory. Recently, however, Meyer and Gagne (2008) have advocated for Self-Determination Theory to be used as the theoretical framework for investigating employee engagement as it seems to intuitively fit within SDT.

## CHAPTER THREE

### SELF-DETERMINATION THEORY

According to Self-Determination Theory (Ryan & Deci, 2000), inside all human beings is an innate desire to grow, develop, improve their environment, and go about life with a passion. Optimal human functioning reflects people that are vibrant, full of energy, inquisitive, creative, take initiative, and are enthusiastic about life and its possibilities. At the other end of the spectrum, are people who are apathetic, indifferent, isolated, and disengaged; gone is their energy and passion for life. According to Self-Determination Theory, these people have unmet needs for competence, autonomy, and relatedness.

Deci and Ryan's early work focused on intrinsic motivation, which they consider to be a lifelong psychological growth function (Deci & Ryan, 1980), and internalization, which they consider to be critical for both psychological integrity and social structure (Ryan, Connell, & Deci, 1985). The three needs of competence, autonomy, and relatedness were arrived at through inductive empirical processes when Deci and Ryan were struggling to make sense of research findings in the area of intrinsic motivation and internalization. Needs in SDT are defined as essential nutriments for optimal human functioning, which if not satisfied, can have detrimental effects on personal well-being. Thus, SDT was created to explain the three essential things necessary for intrinsic motivation, psychological growth, and well-being (Deci & Ryan, 2000).

#### **Competence**

Deci and Ryan (1985) describe the need for competence as a desire to feel effective in interacting with the environment. This drive for effectance is unrelenting. This is what pushes people to continually grow and develop and to take on even more challenging tasks. According to White (1959), there is inherent satisfaction in exercising and extending one's capacities. Pleasurable feelings of competence result only when there is continual stretching of one's abilities (Deci & Ryan, 1985). The need for competence is supported by Csikszentmihalyi's (1988) concept of "flow", where a person becomes completely absorbed or lost in a task due to the pure enjoyment experienced while engaging in it. According to Csikszentmihalyi, optimal challenge is necessary for flow to occur. This helps explain those rare flow experiences by some who temporarily ignore their drives for hunger, thirst, warmth, etc. while experiencing the pleasurable feelings the satisfaction of the need for competence provides (Deci & Ryan, 1985). Notably, the need for competence is highly related to the construct of self-efficacy. The main distinction between the two is that self-efficacy can be viewed as an individual difference among people and competence, according to SDT, is a basic need shared across people. Self-efficacy is a belief that a person holds about their own abilities to accomplish tasks and achieve expected outcomes (Bandura, 1986). These personal beliefs about self-efficacy may or may not be accurate and are focused on a potential task, whereas feelings of competence are experienced after demonstrations of actual mastery.

### **Autonomy**

The need for autonomy takes the need for competence one step further, in that it is an individual's desire to feel like the source of causation, or source of effectance, when

interacting with their environment (deCharms, 1968). According to Deci and Ryan (1985), the need for autonomy is a wish to feel a sense of volition and to experience choice and psychological freedom when carrying out an activity. Angyal (1941) proposed that human development can be characterized by the continual movement toward greater autonomy which relies on the acquisition of various competencies. Deci and Ryan (1985) assert that in order to feel self-determined, or autonomous, an individual must experience a sense of choice when engaging in activities. The construct of autonomy, although similar, is unique from the construct of control, in that the need for autonomy is not necessarily the need for control, but the need to have a choice and freedom from control (Deci & Ryan, 1985). A person's need for autonomy can still be satisfied in instances where they choose not to be in control. Autonomy is also distinct from independence (Ryan & Lynch, 1999) which means to act alone and not rely on others. For example, an individual could be acting autonomously *while* engaging in activities with others (Deci & Ryan, 2008).

### **Relatedness**

Besides autonomy and competence, Deci and Ryan attest that a third need, the need for relatedness, is essential for intrinsic motivation to occur. The need for relatedness is a yearning to feel connected to others and have close and intimate relationships (Deci & Ryan, 2000). It was derived from Baumeister and Leary's (1995) need for belongingness and work by Reis (1994) investigating the importance of experiencing deep interpersonal relationships.

Attachment theorists (e.g. Bowlby, 1979) have shown how an infant that is more securely attached to its caregiver, more readily explores its environment. This helps demonstrate the need for relatedness to be a necessary component of intrinsic motivation. SDT proposes that this phenomenon is not simply limited to early childhood, however, but is evident throughout the lifespan. At all ages, intrinsic motivation is more likely to flourish in contexts characterized by a sense of security and relatedness (Ryan & Deci, 2000). Research conducted by Ryan and Grolnick (1986) found lower levels of intrinsic motivation in the students who experienced their teachers as cold and uncaring. Admittedly, this need for relatedness seems to conflict with the image of intrinsically motivated behaviors being performed in isolation. Ryan and Deci (2000) explain that “proximal relational supports may not be necessary for intrinsic motivation, but a *secure relational base* [emphasis added] does seem to be important for the expression of intrinsic motivation” (p. 71).

Self-Determination Theory suggests that these three needs are essential for motivation and optimal human functioning. Unlike other motivational need theories, Maslow’s Hierarchy of Needs (1943, 1954), and McClelland’s Need Theory (Murray, 1938; McClelland, 1961; McClelland, 1971) for instance, SDT needs are proposed to not diminish when behaviors or activities satisfy the particular need. Instead, SDT suggests that people are fueled to engage in more need-fulfilling activities (Ryan & Deci, 2000). Note that this underlying need satisfaction mechanism will be examined in more detail in the present study.

Also, unlike McClelland's needs for achievement, power, and affiliation, the focus in Self-Determination Theory is not on differences in need strength across people, but on the core belief that these three needs are innate to everyone and are essential for optimal human functioning. Individual differences in SDT needs are attributed to learned social orientation differences that either help or hinder an individual from gaining further need satisfaction. However, SDT focuses on the level of need satisfaction, not individual differences, as the critical component in predicting outcomes (Ryan & Deci, 2000). SDT defines needs as "universal necessities...the nutriments that are essential for optimal human development and integrity" (Ryan, Sheldon, Kasser, & Deci, 1996, p.11). According to this definition, something is a need only to the extent that its satisfaction promotes psychological health and its thwarting undermines psychological health. "The needs for competence, autonomy, and relatedness are considered important for all individuals, so SDT research focuses not on the consequences of the strength of those needs for different individuals, but rather on the consequences of the extent to which individuals are able to satisfy the needs within social environments" (Gagne & Deci, 2005, p. 337).

Several studies have shown a link between Self-Determination Theory need satisfaction and positive employee outcomes, such as increased well-being (Deci & Ryan, 2008), increased job satisfaction, higher job performance, decreased burnout, and reduced turnover intentions (Gagne & Deci, 2005). The focus of this study is SDT need satisfaction as a predictor of employee engagement and well-being. Since according to SDT, need satisfaction is an invigorating experience that fuels more need seeking

behavior, if needs are met within the work environment, this study hypothesized that a person would likely continue to feel engaged by their work as it continues to meet their needs.

*Hypothesis 1: SDT need satisfaction will be positively related to employee engagement.*

CHAPTER FOUR  
THEORETICAL FRAMEWORK

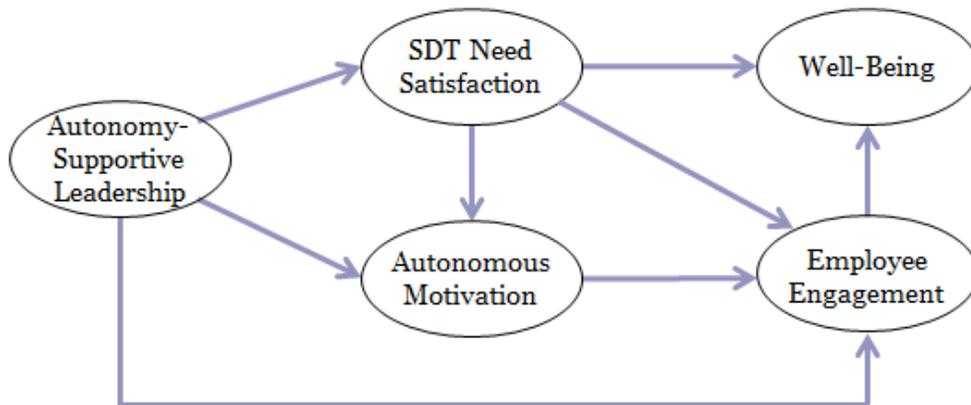


Figure 1: Employee engagement embedded in the SDT theoretical framework

Figure 1 depicts the SDT framework defined by this study, to include the variables of autonomy supportive leadership, SDT need satisfaction, autonomous motivation, well-being, and engagement, and their proposed relationships supported by the literature.

Although this study only addresses the relationships between SDT need satisfaction and employee engagement and well-being with empirical analysis, the larger theoretical model of the SDT is included to show how employee engagement might fit within this framework. A brief explanation of the remaining components of the SDT framework follows below.

**Autonomy-Supportive Leadership**

The interpersonal factors that affect the satisfaction of the three needs of Self-Determination Theory have been grouped into what is termed “autonomy support” (Deci,

Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001). Autonomy-supportive leadership involves taking a subordinate's perspective, encouraging initiative, supporting a sense of choice, and being responsive to their feelings, questions, and ideas. When a person's autonomy is supported, they feel free to follow their interests and decide for themselves the importance of social values and norms (Deci & Ryan, 2008). Research has shown that autonomy support is related to the satisfaction of the three needs for competence, autonomy, and relatedness, which in turn influences job satisfaction and well-being (Baard, Deci, & Ryan, 2004; Deci et al., 2001; Lynch, Plant, & Ryan, 2005). In addition, Deci et al. (1989) showed that training supervisors to be autonomy-supportive increased employees' trust in management.

Clear parallels can be made between transformational leadership and autonomy-supportive leadership. Shamir, House, and Arthur (1993) suggested that transformational leadership involves increasing subordinate's self-efficacy (competence), increasing feelings of belongingness to a group (relatedness), and increasing personal meaning attached to a collective goal (autonomy). Transformational leadership conceptualized by Bass (1985) includes four dimensions, which are idealized influence, inspirational motivation, intellectual stimulation, and individual consideration. One of the factors that distinguishes transformational leadership from that of transactional leadership is the focus on the psychological needs of the followers by the leader (Bono & Judge, 2003). Recent research on transformational leadership has shown the satisfaction of SDT needs to have a mediating effect between transformational leadership and many positive employee outcomes (Kovjanic, Schuh, Jonas, Quaquebeke, Van Dick, 2012).

Kovjanic et al.'s (2012) study showed transformational leadership to foster the satisfaction of subordinate's needs for autonomy, competence, and relatedness. Unlike transactional leaders that are highly concerned with maintaining close control over followers with rewards and punishments, transformational leaders try to inspire followers to adopt the group goal as their own so that they are more autonomously motivated to achieve that goal (Bass, 1985). They also foster a sense of autonomy through intellectual stimulation by encouraging followers to come up with new, more efficient, ways to complete their work (Bass, 1985). Transformational leaders go beyond the task or goal at-hand and challenge their followers to keep improving and striving for even higher goals. These leaders believe in their followers' abilities and help them to achieve their full potential. This fosters a sense of competence in their followers by setting very high expectations and expressing confidence in their ability to achieve them (Shamir et al., 1993). Such continual growth and development increases an individual's sense of competence (Deci & Ryan, 2000). Increasing follower's sense of relatedness comes easily to transformational leaders because of their natural individual consideration. Transformational leaders build a trusting relationship with their followers by responding to the unique needs of each individual (Bass, 1985). In addition to forming close individual relationships, transformational leaderships stress group cohesion, foster a sense of group identity, and focus on maintaining high unit morale by lauding the group's achievements (Burns, 1978).

There is surprisingly little research on the impact of leadership on employee engagement. Previous research has shown autonomy-supportive leadership and similarly,

transformational leadership to increase SDT need satisfaction of followers (Deci et al., 2001; Kovjanec et al., 2012). Although this initial study does not empirically test the relationship between employee engagement and autonomy-supportive leadership, it is an important piece of the overall Self-determination Theory framework. Investigating the relationship between employee engagement and autonomy-supportive leadership is addressed further in the future research section below.

### **Autonomous Work Motivation**

Self-determination is a theory of motivation that depicts people as having a propensity for growth, curiosity, and connection. It postulates that when the needs for competence, autonomy, and relatedness are met, high levels of intrinsic motivation and optimal human functioning are possible (Ryan & Deci, 2000). SDT makes clear distinctions between levels of motivation conceptualized on a continuum from intrinsic motivation being the highest level, to the various forms of extrinsic motivation, down to amotivation, or the lack of motivation at the lowest level (see Figure 2 below). Intrinsic motivation is achieved when an individual's needs are met, their sense of self is congruent with their action, and they are participating in activities that they find interesting. Therefore, intrinsic motivation is fully autonomous effort based on personal interest. It is this type of motivation that compels a person "to get lost in their work," to be completely absorbed, because they are motivated by their own personal interest and it drives them to explore, to learn, and to grow. According to SDT, the necessary fuel for this unlimited quest for growth found with intrinsic motivation is the satisfaction of the three needs for competence, autonomy, and relatedness.

Extrinsic motivation, on the other hand, is driven by a motivating force that is external to the individual. Deci and Ryan (2000) break extrinsic motivation down into several different levels from the most internal to the most external. The most internal forms of extrinsic motivation are referred to as “internalization,” which is critical for social cohesion. With internalization, the motivator may be external, but the individual is able to internalize the values to such a deep level that they become consistent with their sense of self. Thus, the choice to act in accordance with the external rule feels like an autonomous choice. This type of motivation is imperative to social structure and agreed upon rules of conduct. It is also this “internalization” that allows an employee to completely buy-in to the mission of an organization and adopt it as their own.

Internalization is defined as “people taking in values, attitudes, or regulatory structures, such that the external regulation of a behavior is transformed into an internal regulation and thus no longer requires the presence of an external contingency” (Gagne & Deci, 2005, p. 334).

Internalization is behavior that is driven by a sense of purpose, meaning, and belief. The types of regulation deemed internalization are “introjected,” “identified,” and “integrated” self-regulation. Introjected regulation occurs when a guiding principle has been taken in by the person, but has not been completely accepted. Introjected regulation makes a person feel as if they have to behave in a certain way to protect their ego or self-esteem (e. g. “I work because it makes me feel like a worthy person”). In this situation the internalized regulation is controlling the person. This is like the parent’s voice in the child’s head on how good girls or boys are supposed to act. With identified regulation,

people feel more autonomous in their behavior. They have internalized the value and accepted it as important. Identified regulation would motivate a person to do a job even if it wasn't enjoyable because that person sees the value in the job getting done. For example this might look like the following, "I bathe patients because it is essential for their health and well-being. I do my job because it is important." Identified regulation occurs when the individual has deemed the behavior to be important and it is consistent with their personal goals. The most internalized extrinsic regulation is called "integrated regulation," which allows a person to feel completely autonomous in their behavior. With integrated regulation, the behavior is fundamental to the individual's sense of self. "I work because the job I do is a central part of who I am as a person." According to SDT, the satisfaction of the needs for competence and relatedness are necessary for the internalization of external regulations to occur. The degree of internalization, however, whether introjected, identified, or integrated, is dependent upon the level of satisfaction for the individual's need for autonomy (Deci & Ryan, 2000). According to SDT, fully volitional motivation, or autonomous motivation, includes intrinsic motivation, which inspires a person out of interest and enjoyment, and integrated and identified regulation, which drives a person out of a sense of meaning and purpose (Gagne & Deci, 2005).

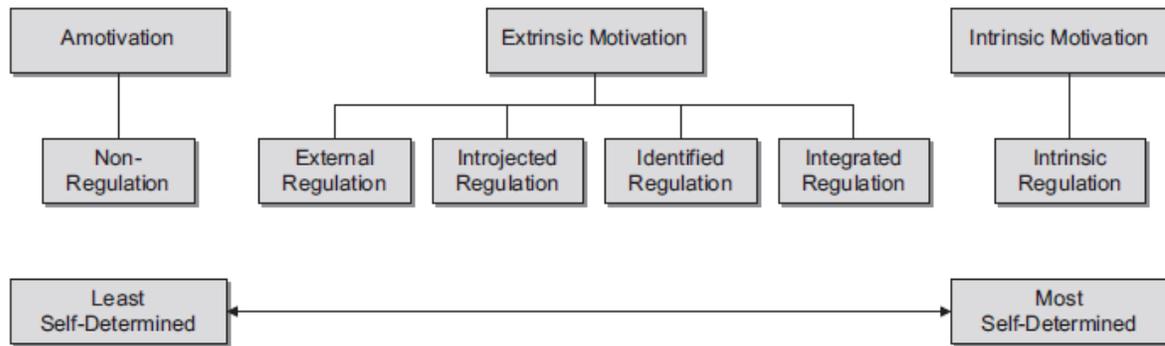


Figure 2: Continuum of Self-Determination Theory (Deci & Ryan, 2000, p. 237)

There has been a shift in SDT from distinguishing simply between intrinsic and extrinsic motivation towards controlled and autonomous motivation. Autonomous motivation has more utility in applied work environments than solely focusing on intrinsic motivation.

“Research has shown that autonomous motivation predicts persistence and adherence and is advantageous for effective performance, especially on complex or heuristic tasks that involve deep information processing or creativity” (Deci & Ryan, 2008, p.14).

Autonomous motivation is especially relevant when researching the construct of employee engagement because it inherently has aspects of internalizing organizational values and going beyond just in-role performance due to interest, meaning, and purpose.

### **Well-Being**

For centuries, philosophers considered happiness to be the highest achievement and ultimate motivator of human behavior, but psychologists were drawn to the study of solving problems, and thus extensively pursued the research of human *unhappiness*.

Recently however, with more emphasis being placed on positive psychology (e.g.

Seligman & Csikszentmihalyi, 2000; Ryan & Deci, 2000), many researchers have turned

their focus to human flourishing and well-being and the many connections to overall health.

One such area of study in psychology that positions psychological well-being as a central tenet is Self-Determination Theory, which asserts that the satisfaction of the needs for competence, autonomy, and relatedness are critical for optimal human functioning. By definition, Deci and Ryan (2000) attest that you can't have well-being without the satisfaction of all three SDT needs. A deficit in any one need would lead to a decrease in well-being. They describe these needs as "innate psychological nutriment that are essential for ongoing psychological growth, integrity, and well-being" (Deci & Ryan, 2000, p. 229).

Consistent with that assertion, many studies have shown a positive relationship between SDT need satisfaction and well-being (Sheldon & Elliott, 1999). Research conducted by Baard, Deci, and Ryan (2004) found that managers who were more autonomy supportive had employees that experienced greater SDT need satisfaction, performed at higher levels, and reported greater well-being than employees of more controlling managers. A study conducted in Bulgaria, where central planning is still the prominent method of management, found even more dramatic results with autonomy-supportive managers having employees who reported the highest levels of need satisfaction and well-being (Deci et al., 2001).

In response to Macey and Schneider's (2008) review of the literature on employee engagement, Meyer and Gagne (2008) proposed that SDT be used as a theoretical framework for the study of employee engagement. They attest that employee

engagement appears to be intimately related to autonomous motivation as defined by SDT. Likewise, Meyer and Gagne recommended that the outcomes of employee engagement be extended to include well-being.

*Hypothesis 2: SDT need satisfaction will be positively related to well-being.*

### **This Study**

This study focused primarily on the relationship between SDT need satisfaction and employee engagement. This relationship has previously been examined by Van den Broeck et al. (2012), but within the JD-R Model (Bakker & Demerouti, 2004) framework. The relationship was not as strong as the researchers expected, which may have been due to the miscategorization of challenge demands (Cavanaugh et al., 2000) as explained earlier (Schaufeli & Taris, 2014). Note too, that this failure to find sufficiently substantive relationships may also be due to misspecification of theoretical models as will be discussed later in the Method Section (Scarborough & Somers, 2006). Figure 3 depicts the research model for this study.

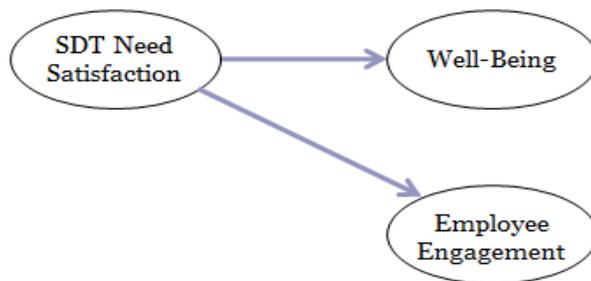


Figure 3: Research model

## CHAPTER FIVE

### COMPUTATIONAL MODELING AND EMPLOYEE ENGAGEMENT

An important aim of this study is to explore the efficacy of computational modeling as a method for clarifying the relationships among satisfaction of the various SDT needs and employee engagement. These relationships have typically been explored using traditional linear analytic methods, such as multiple regression or structural equation modeling (SEM). However, these methods have not resulted in a clear understanding of the relationships among the variables examined in this study. The current state of this area of research has some parallels with examples cited by Vancouver and Weinhardt (2012) and Scarborough and Somers (2006) of cases where the use of computational modeling methods could be particularly insightful. Vancouver and Weinhardt (2012) have an extensive discussion of the limitations of theories discussed exclusively, or almost exclusively in verbal terms. They cite, as examples, the various theories of job attitudes and stress. Scarborough and Somers use the research literature on the relationship between job satisfaction and job performance to make two interesting points: (1) the failure to find a clear and substantial relationship between these two variables may be the result of using only analysis methods that assume a linear relationship. They point out that the exact form of the relationship had not been adequately examined and this might be the root of the failure to find stronger results; (2) the exact form of the relationship is not well specified in the literature.

Much of the research in the organizational sciences is thought to represent dynamic phenomena as humans and social environments are complex, changing systems (Katzell, 1994), and yet rarely has this analytical method been used by organizational researchers. While this analytic approach is relatively new, there still has only been one article in the *Journal of Applied Psychology* using computational models to date (Vancouver, Weinhardt, and Schmidt, 2010). The present study lends itself as an excellent opportunity for the use of computational modeling due to the dynamic nature of the need satisfaction processes. There is also much clarity to be gained for the employee engagement construct and Self-Determination Theory as both have relied heavily upon verbal descriptions of their phenomena and linear relationships among variables in past research.

### **Three Models for SDT Need Satisfaction**

This study competitively examines multiple models by which employee engagement and need satisfaction might be related, all of which are compatible with the various existing descriptions of Self-Determination Theory. Computational modelling was used to test three potential models of the SDT need satisfaction mechanism, including a linear model, step model, and a ramp model to see which best predicted self-reported employee engagement and well-being.

**Linear model.** The linear model is what is most often assumed in SDT research. This model shows a direct relationship between SDT need satisfaction and outcomes, where an increase in one would result in an increase in the other. The review of the employee engagement literature conducted for this study, found no discussion of any

reason to assume linear mechanisms. Figure 4 shows the visual depiction of the linear model.



Figure 4: Visual depiction of a linear model of need satisfaction

**Step model.** The step model is what is traditionally used to describe a need satisfaction process. According to Drive-Reduction Theory, need satisfaction follows the classic homeostasis model (Hull, 1943). Needs are “unsatisfied” until a setpoint is reached and once satisfied, no more satisfaction-seeking behavior is observed. Figure 5 shows a visual depiction of the step model.

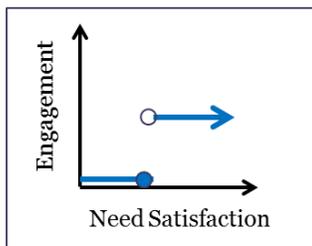


Figure 5: Visual depiction of step model

**Ramp model.** One of the earliest models of work motivation, the Two-Factor Theory (Herzberg, 1959) theorized what was essentially a ramp model of need satisfaction. Herzberg proposed that increases in job satisfaction would not be observed until job "satisfiers" were present in the work environment, which corresponded to the

satisfaction of higher level needs, such as recognition and advancement, versus only the job "dissatisfiers," which were elements of the work environment like pay and stability. These job dissatisfiers corresponded to lower level, or "hygiene" needs (Maslow, 1940). An increase in job satisfiers would then result in a corresponding increase in job satisfaction. Figure 6 shows a visual depiction of the ramp model.

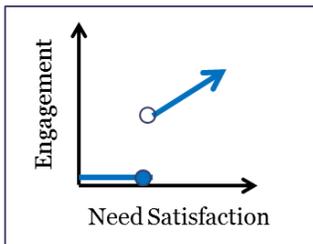


Figure 6: Visual depiction of ramp model

The SDT literature describes a model of need satisfaction that appears to be a ramp function. According to SDT, a need is essential for health and well-being, so therefore any detriment or lack of need satisfaction in an area would likely result in very low outcome measures. This would be the case until need satisfaction occurs, at which point this need satisfaction would fuel even more satisfaction-seeking behavior, resulting in linearly increasing outcome measures.

*Hypothesis 3: The ramp model of SDT need satisfaction will be the best predictor of employee engagement.*

## CHAPTER SIX

### METHOD

Once the system was defined, the relationships were described using both a graphical model and mathematical explanations of the relationships among the variables, see Figure 3 above for the overall theoretical model. In order to test these variables and relationships using computational modeling, it was further necessary to specify equations relating the various components. As noted above, during the literature search for this study, it became apparent that the underlying mechanism of need satisfaction was not explicitly specified by Self-Determination Theory. Thus, three competing mechanisms were proposed to include a linear model, step model, and ramp model. Please note that all three of these models are compatible with existing verbal descriptions of Self-determination Theory

#### **Sample**

Data used for this study was taken from a staff survey administered to employees of a midsize southeastern public university at the end of the 2011/2012 academic year. Participants were 508 staff members from various support areas including financial, administrative, personnel, and facilities. Participants were contacted via email to participate in a voluntary climate survey.

#### **Measures**

**SDT need satisfaction.** The Self-Determination Theory Need Satisfaction measure was adapted from the existing staff survey items that asked questions regarding the underlying constructs of competence, autonomy, and relatedness. Wherever possible,

items were chosen that closely resembled items from Deci et al. (2001) Basic Need Satisfaction at Work scale. The items were measured using a five point Likert scale format from “strongly agree” to “strongly disagree.” Competence was measured with four items. An example item includes, “I work hard because I want to understand my job better.” Autonomy was measured with five items. For instance, “I have sufficient authority to do my job well.” Relatedness was measured using four items. An example relatedness item is “I get along with my coworkers.” Internal consistency for the items for competence, autonomy, and relatedness, were found to be reliable ( $\alpha = 0.8, 0.84,$  and  $0.72$  respectively).

**Employee engagement.** Employee engagement was assessed using four items from prior research (Britt, 2003). The measure consists of four items which focus on employee’s perceived responsibility for job performance, and how much that performance matters to the individual. Example items included, “I am committed to performing my job well” and “I invest a large part of myself into my job performance.” These items were rated on a five point Likert scale, which ranged from “strongly agree” to “strongly disagree.”

**Well-being.** A shortened version of the General Health Questionnaire (Goldberg, 1979) was used to measure well-being. The scale consists of six items using a five-point Likert scale from “strongly agree” to “strongly disagree.” Sample items include, “Have you recently been feeling unhappy and depressed?” and “Have you recently been losing confidence in yourself?”

## **Analysis**

**Procedure - computational modelling.** Analyses were conducted using a computational modeling program written in the programming language Delphi and augmented with analyses in Microsoft Excel. This analytical method was chosen due to its effectiveness with the development of theories involving potential non-linear, dynamic phenomena (Vancouver & Weinhardt, 2012). Using this approach, this study compared three competing models of the dynamic process underlying SDT need satisfaction.

**Determination of the model parameters.** The basic principle in a computational modelling analysis is not to determine if an observed set of results is likely to have occurred by chance, as in classical inferential statistics, but rather to compare models to see which best fits a set of empirical data. This type of analysis closely mirrors that of a typical validation study, where a set of parameters for a regression model are determined from a data set, then that model is applied to a cross-validation sample to see if it fits. The purpose of the cross-validation sample is largely to address the issue of capitalization on chance in the initial determination of the parameters. Likewise, in a computational modelling study, the parameters for the various models are determined from a study sample, but the actual head-to-head test of the competing models is done with a separate "cross-validation" sample to avoid the capitalization on chance problem. In this study, 25% of the original sample (n=127) was held out to act as the cross-validation sample, and the model parameters were determined from the remaining 75% (n=381).

**Ambiguity about the terms used to describe the theoretical model(s).** The research literature of Self-Determination Theory uses the term "need" rather loosely as

compared to the strict definition found in other theories, e.g. homeostasis in Drive-Reduction Theory (Hull, 1943). Per homeostasis, there is a setpoint for each need. If the level of need satisfaction, or the perceived level of incoming stimuli, is below that setpoint, then need-satisfaction-directed behavior will occur. But in this domain, the relationship is inverted. No behavior (or affective state), in this case “engagement,” will occur until the setpoint is reached, then the state will be enacted. In other words, we should see no engagement reported until some SDT needs satisfaction setpoint is reached, then the state of engagement will be enacted. So a true "need" model is the "step" model we are testing, described further below.

**Need satisfaction models and their parameters.** Three different plausible mechanisms underlying SDT need satisfaction were evaluated, including a linear model, step model, and ramp model. The equations for each model are detailed below where “EngagementHat” is the predicted engagement score. The default equation of an unweighted linear combination of the independent variables was used. There was no a priori reason from theory or empirical evidence to do otherwise. For the purposes of this study, we needed a head-to-head comparative test of the models themselves without further complicating the theoretical structure. Therefore, the independent variable (IV) composite is just the mean of the participants’ IV scores, which is the most parsimonious structure.

***Linear model.*** [Predicted Engagement = constant + weights(independent variables)]. The linear model is straightforward with a direct relationship between SDT need satisfaction and employee engagement. The higher level of need satisfaction, the

higher should be reported employee engagement. The linear model is represented mathematically as follows, where the coefficients were found using Ordinary Least Squares (OLS) multiple regression with Autonomy, Competence, and Relatedness as the IVs and Engagement as the dependent variable (DV).

$$\text{EngagementHat}:=2.628+(\text{Competence}*0.471)+(\text{Autonomy}*0.04)+(\text{Relatedness}*0.073)$$

*Step model.* With the step model, individuals with unsatisfied needs would report fairly constant low levels of engagement until a minimum need satisfaction level is reached, at which point they would become engaged in their work. The satisfaction point, in this case, was derived empirically from a verbal description of the model in addition to the examination of the data in the test/construction sample. The step model is represented mathematically as follows:

if  $\text{PredComposite}>3.5$  then  $\text{EngagementHat}:=5$ ;

if  $(\text{PredComposite}\leq 3.5)$  and  $(\text{PredComposite}>2.0)$  then  $\text{EngagementHat}:=4$ ;

if  $\text{PredComposite}\leq 2.0$  then  $\text{EngagementHat}:=2$ ;

Please note several things about this model. First, it never predicts a "1" response since there is no mechanism in the model to distinguish or predict between a 2 or a 1. Because central tendency error is likely in this domain, the model was setup so it predicts a 2. Likewise, it never predicts a "3" response. A strict need model is simply a step function and does not make fine-grained predictions around the setpoint. Another important note about the step model is that since it is constrained to integer outputs, it is at a natural disadvantage to the linear model. The actual reported engagement score as a composite of the engagement items is not limited to integers. Even though the

respondent could only circle an integer (from 1 to 5), the composite engagement score is an average of those responses, and therefore is a real number (decimal), not an integer. But since the root-mean-square error (RMSE) analysis calculates the difference between the predicted number (in the case of the step model always an integer) and the actual reported number (a real number), the step model, unlike the linear model, will always have some amount of error that is due to the scoring system, and not due to inherent inaccuracies in the model. Presumably the step model could be tuned or refined to produce real numbers as predicted engagement scores but this was not the approach that was taken, as it is less conservative.

***Ramp model.*** This proposed version of Self-determination Theory describes the underlying mechanism of need satisfaction as what could be depicted as a ramp model. In this model, needs are “unsatisfied” until a setpoint is reached. After reaching this minimum level of need satisfaction, the positive outcomes kick in and a linear relationship is then observed between need satisfaction and outcomes. The ramp model is represented mathematically as follows:

```
PredComposite:=(Competence+Autonomy+Relatedness)/3;  
if PredComposite<3.0 then EngagementHat:=2;  
if PredComposite>=3.0 then EngagementHat:=PredComposite;
```

The note above about the step model being at a scoring disadvantage to the linear model, also applies to the ramp model for predictor composite scores below 3.0 (i.e., all the not-very-satisfied employees). Note, that there is no known statistical test for testing the relative fits of the models. There are, however, some fairly sophisticated methods for

model comparison (e.g., information criteria, such as the Akaike information criterion used in SEM) and minimum-description length and Bayes factors approaches (Vandekerckhove, Matzke, & Wagenmakers, 2015) that trade off goodness-of-fit and model parsimony. However, the use of these methods was considered to add little value for the additional level of complication. Therefore, a simple RMSE goodness of fit index is used in this study. RMSE in the present case is a straightforward index of the relative accuracy of each model in predicting the employee engagement and well-being scores in the hold-out sample. Note that this index should not be confused with the Root Mean Square Error of Approximation (RMSEA) used in SEM. While both of these indices indicate perfect model fit when the index is zero, the RMSEA is actually a method of adjusting for sample size the chi-square fit indices used in SEM .

**Determining the model set points.** A problem with the non-linear models is that there is no empirical evidence or theoretical guidance about where the setpoints are. Additionally, there will be individual differences in the setpoints. In order to determine setpoints for the model comparisons, this study had to assume that there was minimal individual variability in the setpoints and tried to find a "universal" setpoint for each need. This approach makes the head-to-head model comparison even more conservative. The linear model is the typical or most popular model assumed, but it does not have a setpoint, so no setpoint needed to be estimated. Moreover, the parameters in that model are optimized by the OLS criterion. The other two models do need a setpoint so any error in the setpoint would result in poorer model fit and give an advantage to the linear model.

The "universal" setpoints were chosen strictly empirically as there was no guidance found in the literature and no statistical optimizing function as there is for the linear model. The cumulative frequency distributions of the DVs were examined to see if there were apparent discontinuities in the curves that would imply a setpoint. Figure 7 below shows the cumulative frequency distribution of employee engagement.

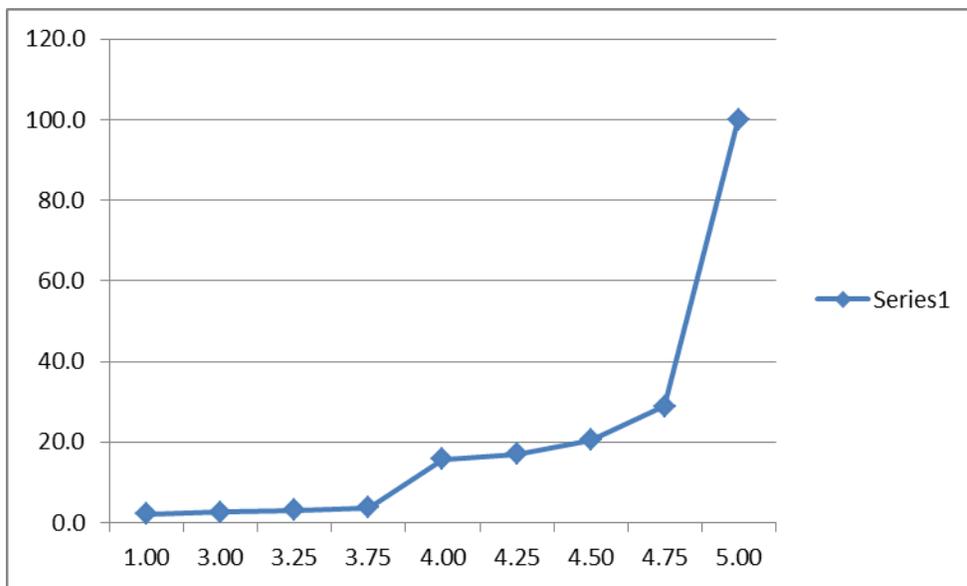


Figure 7: Cumulative frequency distribution of employee engagement

Note the big jumps in frequencies around 4 and 5 on the survey. Seventy percent of the sample gave Engagement a mean response of 5, i.e., these respondents are highly engaged. Only about 10% gave a mean response lower than 4. This was interpreted as an indicator of a possible setpoint between 3.75 and 4.00.

It should be noted that from the theoretical point of view in the homeostatic model, engagement is the effector, i.e. it is analogous to the air conditioner (AC) in a thermostatic system. The independent variables roughly correspond to the sun, or a

source of heat. If it stays cold the "need" never gets satisfied, and the AC never comes on, but if it gets sufficiently hot, then the AC comes on. The AC is either on or off; just as in the step model engagement is either on or off with no middle ground. You are either engaged in your job or you are not and the fine distinctions are just noise.

Although, this is where the analogy breaks down a bit, because the action of the AC is to reduce the heat. On the job, the state of engagement has little to do with the incoming need satisfaction. An exception to this may be a fairly complicated reciprocal causality model.

### **Model Evaluation**

The next step was to conduct RMSE analysis where the predicted engagement score from each of the three competing models was compared to the actual, or observed, engagement score. There are several important points about the RMSE analysis. First, the RMSE index is in the same units as the original measurements. A five-point Likert scale was used to collect the self-report data, thus the errors could range from zero (perfect prediction) to five (maximum mis-prediction). Therefore, the results can be directly interpreted in terms of the error versus the original scale. For example, an RMSE index of less than one, indicates that a typical predicted employee engagement score of four will be inaccurate by less than one full point on that scale. So the actual reported employee engagement will likely be between 3 and 5. Second, only the magnitude, and not the direction of mispredictions, is shown in the RMSE index. Third, although the RMSE index for the test/construction example is shown below, only the results for the cross-validation sample are empirically meaningful. Although, do note that the RMSE

indices for the test/construction sample follow exactly the pattern that should be expected; The linear model, optimized by the OLS regression procedure, is likely to show the best model fit, followed by the more empirical models with their parameters chosen by judgment and inspection.

## CHAPTER SEVEN

### RESULTS

Tables 2 summarize the results of this study. Table 1 shows the RMSE values for the test/construction sample, which used 75% of the data (n=381). In the test/construction sample, the linear model outperformed the step model and ramp model by making a closer prediction of the actual reported engagement scores, as expected. As discussed above, the linear model had a mathematical advantage in the test/construction sample due to the parameters being optimized for that sample. Table 2 shows the RMSE values from the hold out cross-validation sample. Note that the parameters for the linear model are not optimized for the cross-validation sample. From this sample, the best-fitting employee engagement model (or the model with the most accurate predictions of employee engagement based on SDT need satisfaction levels) is the ramp model. The average prediction error for this model is less than 3/4ths of a point on the 5-point Likert scale. In comparison, the typical prediction error for the classic linear model is over a full point on that same scale. While the linear model was not the best predictor of employee engagement, it performed the best as a predictor of well-being. However, none of the models were very accurate in this regard. Therefore, hypothesis 1 was supported, but hypothesis 2 was not supported. Table 2 shows that all three models are likely to have errors substantially above a full point on the five-point scale when predicting well-being.

Table 1

*Comparison of RMSE of the Need Satisfaction Mechanism Model Predictions*

<u>DV</u>	<u>Linear Model</u>	<u>Step Model</u>	<u>Ramp Model</u>
Employee Engagement	0.65	0.80	1.46

*Note.* Results from 75% test/construction sample (n=381)

Table 2

*Comparison of RMSE of the Need Satisfaction Mechanism Model Predictions*

<u>DV</u>	<u>Linear Model</u>	<u>Step Model</u>	<u>Ramp Model</u>
Employee Engagement	1.16	1.00	0.73
Well-being	1.44	2.20	1.82

*Note.* Results from 25% cross-validation sample (n=127)

### **Significance Tests**

An important aspect of analyzing these results was to conduct a significance test to determine if the models predict employee engagement any better than chance. The best a priori prediction of engagement, given no other information or simply by chance, would be the mid-point of the scale, which corresponds to the value 3.0. Single-sample t-tests were conducted for the linear model and ramp model predictions compared to the reference value of 3.0. Both predictions were significantly different from chance. The linear model conditions being  $t(126) = 71.02, p=.001$  (mean difference = 1.661) and the ramp model conditions being  $t(126) = 2.457, p=.015$  (mean difference = 0.171). Note

that these tests do not address the question of which model was more accurate, but only answer if the models predictions were significantly different from chance. Another aspect to the significance testing that needed to be addressed was whether or not the models were significantly different from each other. To test this, a paired-samples t-test was conducted of the ramp versus linear predictions. The ramp model predictions were significantly different from the linear model predictions ( $t = 27.7$ ,  $df=126$ , at the  $p=.001$  level). Thus, the ramp model predictions were sufficiently better than the linear model predictions since the difference was not due to chance. Therefore, hypothesis 3 was supported.

## CHAPTER EIGHT

### DISCUSSION

Employee engagement has emerged as a popular organizational achievement measure in the business community. As such, companies are looking to organizational researchers for a better understanding of the construct in order to assist them in increasing the engagement level of their workforce (Shuck, 2012). Research on the topic has been steadily gaining momentum, but debate among researchers continues regarding the construct's conceptualization, measurement, and antecedents. A key piece that has been missing in the research of employee engagement has been a robust theoretical framework of motivation (Meyer & Gagne, 2008). This paper begins to address this need by investigating the proposition by Meyer and Gagne to ground the employee engagement construct in the Self-Determination Theory framework by positioning it as an outcome of SDT need satisfaction. As more and more researchers are moving away from the burnout-antithesis model of engagement (e.g. LePine et al., 2010; Shuck, 2010), as questions have surfaced regarding the accuracy of the JD-R model to depict motivational processes (Schaufeli & Taris, 2014), and returning to the original conceptualization of engagement as a needs-based motivation construct (Kahn, 1990), the SDT theory of motivation may be the framework necessary to put all of the pieces together (Meyer & Gagne, 2008).

This study accomplished the first step in the investigation of employee engagement being driven by the satisfaction of the three basic human needs of competence, autonomy, and relatedness. A theoretical framework was constructed

around the SDT literature where need satisfaction has been shown to predict well-being and mediate the relationship between autonomy-supportive leadership and autonomous motivation. Employee engagement was embedded within this theoretical framework as an outcome of SDT need satisfaction as depicted in Figure 1 above. Three competing models of SDT need satisfaction were evaluated using data collected from 509 staff members of a midsize university. The theoretical framework was then tested using a computational modeling approach.

The results of this study indicate some preliminary support for embedding employee engagement in the theoretical framework of Self-Determination Theory as proposed by Meyer and Gagne (2008), as all three models of SDT need satisfaction were good predictors of employee engagement with RMSE values of 0.73, 1.0, and 1.16 (on a five point scale). The major contribution of this study, however, was the detailed examination of the underlying need satisfaction mechanism of SDT. Three competing models were tested to include a linear model, step model, and ramp model, to explore the dynamic relationship between levels of need satisfaction and employee engagement. The research hypothesis was supported, as the results indicate that the "ramp" model, conceptually similar to Herzberg's original formulation of job satisfaction/dissatisfaction (1957), was the best predictor of employee engagement. The linear model is typically the model that has been used in SDT research, but this study found the ramp model to have the lowest root-mean-squared deviation of the observed value from the predicted value (RMSE = 0.73, on a 5 point scale) as compared to the step model (RMSE = 1.0) and linear model (RMSE = 1.44). All three models were not very accurate in predicting

well-being, however. The RMSE values for the models with well-being as the outcome were 1.44 -2.2 points (on a five point scale) off from the observed values. This result was unexpected and could be due to some of the limitations of this study that will be discussed in more detail below.

Due to the highly rigorous computational modeling approach, this study was only able to accomplish the first step in investigating SDT need satisfaction as a predictor of employee engagement, which was the construction of the research model framework and the determination of the underlying SDT need satisfaction mechanism. The investigation of the relationships between the variables in the larger model of the SDT framework is recommended for future research below.

### **Limitations and Future Research**

There are some notable limitations in the present study. Probably the largest limitation was the need to balance complexity with model accuracy for overall model parsimony. Tradeoffs had to be made when constructing the model parameters, making decisions to fine tune model parameters or not, and choosing a goodness of fit index. Note another area where this tradeoff was made was with the SDT need satisfaction measure. Typically this measure is represented through an additive process of the means of the three needs for competence, autonomy, and relatedness, combining into one overall need satisfaction measure, and this was the method replicated in this study. However, this technique could be explored in future studies by investigating weights for the three needs or exploring interactions between the three needs or other relative processes. Instead, this study chose to examine in detail the underlying need satisfaction mechanism,

but the method for combining the three needs could be explored in detail in future research.

Another limitation of this study is the scope of the research conducted. Like it was mentioned earlier in the model development section, many unforeseen obstacles arose when trying to construct a computational model of the SDT framework. Despite the setback that this creates, it is one of the advantages to choosing a computational modeling approach, as it flushes out any ambiguities found within the descriptions of verbal theories. The present study focused on the underlying need satisfaction mechanism as it relates to employee engagement and well-being. Conclusions cannot yet be drawn about the relationships between the variables of SDT need satisfaction and employee engagement and well-being until the underlying need satisfaction mechanism was determined to build the research model. Some of the other parts of the research model, specifically autonomy-supportive leadership and autonomous motivation, were not included in the analysis of this study, but are important pieces of the overall model framework. Testing the specific relationships between all of the variables in the research model is recommended for future research.

### **Practical Implications**

Employee engagement is believed to be by many in the business industry a critical determining factor for a company's success (Vance, 2006). Research on employee engagement in applied settings has shown it to be linked to several positive organizational outcomes to include employee loyalty, customer satisfaction, productivity, and profit (Harter et al., 2002). The practical implications from the research of SDT need

satisfaction as a predictor of employee engagement have the potential to be widespread as many corporations are still very interested in increasing employee engagement in their organizations.

The results of this study showed the ramp model of SDT need satisfaction to be the best predictor of employee engagement. The ramp model outperformed the step model (traditional need satisfaction) and the linear model (assumed model in research). The practical implications for this finding are similar to Herzberg's (1959) research on satisfiers and dissatisfiers at work. In Herzberg's pointed out that in order for the satisfiers such as challenging work, recognition, involvement in decision-making, to have much of an impact on an employee's overall job satisfaction, the "dissatisfiers," such as things like poor working conditions, low pay, job insecurity, first had to be removed. Similarly, this study shows that the very basic aspects of the needs for competence, autonomy, and relatedness need to be satisfied first before an employee is likely to become engaged in their work. According to SDT, and the results of this study would suggest, that once an employee's basic needs are being satisfied within the work environment, they are more likely to continue satisfaction-seeking behavior, thus increasing their level of engagement.

If it can be confirmed in future research that SDT need satisfaction predicts engagement, then organizations can focus on interventions which would increase the three basic needs of their employees. One such organizational intervention for increasing employee engagement that would be recommended is to increase the autonomy-supportive leadership (similar to transformational leadership) capability of the managers

in the organization. Previous research has shown autonomy-supportive leadership to be a trainable aspect of leadership and shown it to predict levels of need satisfaction (Baard et al., 2004).

There is some need for urgency around the study of employee engagement, as the window of opportunity for organizational researchers to make such a profound impact on the workforces of corporations in this regard may be closing. There appears to be a growing number of organizations that are becoming disenchanted with the concept of employee engagement altogether due to lackluster results from their interventions (Wagner, 2015). This is a pivotal time for the academic community to further the research on the antecedents of employee engagement so that organizations can find more success in increasing employee engagement. This study was a first step in showing preliminary support for the assertion made by Meyer and Gagne (2008) to ground employee engagement in the Self-Determination Theory framework. SDT need satisfaction as a predictor of employee engagement aligns well with the original conceptualization of the construct by Kahn (1990) as a motivational variable spanning the intrinsic and extrinsic continuum. In order to further this line of research, this study accomplished the first step in building the research model and determining the underlying need satisfaction mechanism.

## APPENDICES

Appendix A

Correlation Table

Table 3

*Correlations between SDT Needs and Outcomes*

Measure	1	2	3	4	5
1. Competence	--				
2. Autonomy	0.123401	--			
3. Relatedness	0.122056	0.500062	--		
4. Engagement	0.094695	0.072094	-0.05741	--	
6. Well-being	0.031335	0.258049	0.26396	-0.05417	--

## Appendix B

### Measures

#### **SDT Need Satisfaction Items**

##### **Autonomy**

1. I have sufficient authority to do my job well.
2. I am satisfied with my involvement in decisions that affect my work.
3. My supervisor involves me in planning our work.
4. My supervisor involves me in making decisions related that affect our work.
5. How much pressure do you feel because you are not involved in decision-making at work?

##### **Relatedness**

1. I get along with my co-workers.
2. There is good cooperation between the employees in my department.
3. At Clemson University teamwork is encouraged.
4. At Clemson University teamwork is acknowledged.

##### **Autonomy-Supportive Leadership**

1. My direct supervisor treats me with respect.
2. My direct supervisor treats my time as valuable.
3. I feel my opinions and suggestions are valued by my supervisor.
4. My supervisor involves me in solving problems related to our work.
5. My supervisor tries to make the changes I suggest.
6. My supervisor does a good job of encouraging my career path development.

### **Autonomous Motivation**

1. I do my job because I receive a salary.
2. It is important for me to know my job.
3. It is important to me to do well at my job.
4. My job is fun.
5. I do my job because I enjoy the type of work I do.
6. I enjoy participating in tasks related to my job.
7. I enjoy my job.
8. I feel that my job is important for representing who I am.
9. My job is important to my sense of who I am.

### **Employee Engagement**

1. I am committed to performing well at my job.
2. How well I do at my job matters a great deal to me.
3. I really care about the outcomes that result from my job performance.
4. I invest a large part of myself into my job performance

### **Well-Being**

1. Have you recently not been able to concentrate on whatever you are doing?
2. Have you recently lost much sleep over worry?
3. Have you recently felt constantly under strain?
4. Have you recently felt that you could not overcome your difficulties?
5. Have you recently been feeling unhappy and depressed?
6. Have you recently been losing confidence in yourself?

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