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An Exploration of the Core Self-Evaluations- Performance Relationship: The Roles of Engagement and Need for Achievement

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AN EXPLORATION OF THE CORE SELF-EVALUATIONS- PERFORMANCE
RELATIONSHIP: THE ROLES OF ENGAGEMENT AND
NEED FOR ACHIEVEMENT

A Thesis
Presented to
the Graduate School of
Clemson University

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

by
Christine Lynn Haugh
May 2010

Accepted by:
Dr. Thomas W. Britt, Committee Chair
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Dr. Patrick J. Rosopa

ABSTRACT

The present study proposed a moderated mediation model involving the personality variables of core self-evaluations (CSE) and need for achievement (nAch), and the motivational state of engagement as predictors of task performance. CSE was hypothesized to interact with nAch to predict two domains of engagement, such that higher scores in measures of both variables would lead to increased performance in these domains. The narrow domain was represented by a single psychology test, and the broad domain referred to overall academic engagement and performance, as measured by cumulative GPA. CSE was also hypothesized to be directly related to performance in these same domains. Usable surveys were collected from five-hundred ninety-four undergraduate students; test score was available for 95% of the participants, although GPA was only accessible for 27% of the sample. The results suggested that the hypothesized CSE*nAch interaction was not significant; the direct CSE- performance relationship was also not supported by the results. Engagement was only related to performance in the general academic domain; this domain was also the only one in which the CSE-engagement relationship reached statistical significance. Possible explanations for the findings are presented, followed by limitations of the study and implications of the results. Lastly, suggestions are made for future research in this area.

DEDICATION

To my fiancé, who has been incredibly supportive and encouraging throughout this process.

To my sister, who has always believed in me.

And to my parents, from whom I learned the meaning of hard work and perseverance.

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CHAPTER ONE

INTRODUCTION

In the field of industrial-organizational psychology, job performance is possibly the quintessential variable of interest. Countless attempts have been made to measure, predict, and enhance job performance. Thus, identifying antecedents of this outcome are of great significance to researchers and practitioners alike. Although education and experience in applicant backgrounds have long been targeted by hiring professionals, many practitioners are increasingly integrating personality measures into selection criteria. Despite the fluctuation of dispositional assessments' popularity with researchers, a 2003 study by Management Recruiters International reported that 30 percent of American companies currently incorporate them in the hiring process (as cited in Heller, 2005).

Many have attributed this boost in personality research and continued company use in part to the publication of influential meta-analyses in the early 1990s that demonstrated the predictive ability of several dispositional variables (Griffin, Hesketh, & Grayson, 2004). As noted by Smith and Schneider (2004), "the 1990s were characterized by the rebirth of personality research" (p. 387). These reviews effectively established the criterion-related validity of personality tests and linked certain personality dimensions to performance (e.g., Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991), fostering greater confidence in dispositional assessments as predictive tools. For example, Barrick and Mount (1991) found that the relationship between conscientiousness and performance was .22. Rothstein and Goffin (2006) stated that while this may seem like a

relatively small correlation, the results of such studies had a large impact on researchers due to the more optimistic view that it provided of personality's predictive potential for job performance than was held in the past.

In addition to conscientiousness, another trait that has been found to be related to performance is core self-evaluations (CSE), a construct which Judge, Van Vianen, and De Pater (2004) defined as “a higher order concept representing the fundamental evaluations that people make about themselves and their functioning in the environment” (p. 326). CSE is comprised of four similar yet distinct personality traits: self-esteem, generalized self-efficacy, locus of control, and neuroticism. First introduced in 1997 by Judge, Locke and Durham, dozens of studies have included CSE as a predictor once research demonstrated that it is a higher order factor.

Among the results of such studies is evidence that CSE is both directly and indirectly related to performance, as the relationship has been found to be partially mediated by certain types of motivation (Erez & Judge, 2001). It is likely, then, that CSE will also be related to other motivational components including engagement, which is characterized by a commitment to excelling due to a felt personal responsibility for and investment in a task (Britt, 2003a; 2003b). In turn, although the relationship between CSE and engagement has been untested to date, the present review will detail the hypothesis that this relationship will be moderated by the need for achievement (nAch), which is a “personal striving of individuals to attain goals” (Cassidy & Lynn, 1989, p. 301). The positive benefits of engagement and performance that result from having high core self-evaluations are hypothesized to be amplified by this drive. That is, the relationship

between CSE and performance, through engagement, should be especially strong for individuals high in nAch. Without the presence of this drive to succeed as measured by nAch, high CSE could be analogous to unreached potential. It is through the combination of high CSE and high nAch that the greatest engagement and highest performance will be achieved (see Figure 1 for the proposed model).

The present study examined engagement as a mediator of the CSE- performance relationship; in addition, nAch was included as a moderator of the CSE- engagement relationship. Within an academic context, both a broad performance domain - grade point average (GPA) - was included along with a narrow performance domain- a single score on a class test. An investigation of the effects that the CSE and nAch personality variables have on distal performance outcomes could allow further understanding of how and when personality and motivation interact to produce work outcomes.

The present study will first provide a detailed explanation of the CSE, engagement, and nAch constructs, and will be followed by an explication of the theorized relationships between them. Multiple hypotheses will specify the expected correlations and interactions of these variables, which are expected to predict domain- specific and general performance., The method will be detailed and will include the study's design participants and procedure, measures, and results. Implications for the findings will be discussed along with the limitations of the study, followed by directions for future research.

Core Self-Evaluations

Origins and Conceptualizations

The discovery of the core-self evaluations construct arose from a search of diverse areas of psychology and philosophy in an effort to identify dispositional antecedents of job satisfaction (Bono & Judge, 2003). CSE are subconscious and fundamental assessments that individuals make about themselves and their daily functioning; these conclusions influence *external* evaluations, which are how individuals perceive others and the world (Bono & Judge, 2003; Judge, Bono, & Locke, 2000; Judge, Van Vianen, & De Pater, 2004). Furthermore, Judge (2009) noted that the CSE concept is broader than a self-worth assessment since it incorporates appraisals of one's competence, capabilities, and the belief that life will turn out well. Those who have high scores on measures of this construct are known as "well adjusted, positive, self-confident" and "efficacious" (Judge, Erez, Bono, & Thoresen, 2003, p. 304). As previously noted, CSE is comprised of self-esteem, generalized self-efficacy, locus of control, and neuroticism; each will be further described below.

The Four CSE Traits

As the basic assessment of oneself, self-esteem is the most fundamental self-evaluation. Self-esteem involves the acceptance, liking, and respect of oneself and is the perceived overall value that one believes oneself to have (Judge, Erez, & Bono, 1998; Judge et al., 2003). Generalized self-efficacy is an appraisal of one's ability to perform across various contexts, or the belief in one's personal capability to accomplish goals and maintain general control over the events in life (Bono & Judge, 2003; Judge et al., 2003). Locus of control also involves controlling one's existence: internal locus of control is characterized by the perception that one is generally in command of life's events, as

compared to external locus of control, which attributes this power to the environment or fate (Judge et al., 2003; Judge, Locke, Durham, & Kluger, 1998). Lastly, neuroticism, the negative pole of emotional stability, is one of the Big Five personality traits. This disposition is characterized by a tendency towards negativity and anxiety, and is closely related to negative affect (Bono & Judge, 2003). Those who score highly on measures of this disposition tend to experience anxiety, anger, depression, and self-consciousness and to act more dependent on others (Judge et al., 1998). All together, the four traits included in the core-self evaluations construct have been involved in more than 50,000 studies and are clearly of interest to industrial – organizational psychologists (Bono & Judge, 2003).

To be considered as a CSE, each of the core traits had to meet three rigorous criteria. Firstly, they had to be of a self-evaluative focus, not a *description* of a trait or behaviors. Johnson, Rosen, and Levy (2008) explain, “certain personality traits (e.g., agreeableness) describe a set of behaviors (e.g., cooperating and showing sympathy), whereas other traits (e.g., self-esteem) are evaluations of the self that communicate self-worth” (p. 392). The distinction is noteworthy because self- evaluative traits are directly related to attitudinal outcomes such as job satisfaction, whereas descriptive traits are only indirectly related to these outcomes because they must operate through self- evaluative traits (Johnson, Rosen, & Levy, 2008). The second criterion was fundamentality, meaning that the trait must be central to one’s identity and not a surface attribute, such as a habit or role (Johnson, Rosen, & Levy, 2008; McCrae et. al, 2000). The final condition was scope, as the trait must be cardinal or broad, and not context- specific (Bono & Judge, 2003; Johnson, Rosen, & Levy, 2008). The constraints to include a dispositional

variable as a core trait were sufficiently narrow and the components broad enough such that they adequately represented the content domain of positive self-regard characteristics.

The four traits share many conceptual similarities, resulting in a concept that is quite coherent overall. Low neuroticism has been seen as an indication of self-esteem; therefore, a clear relationship exists between the two variables. Self-esteem is the appraisal of one's self-worth and significance, while self-efficacy is one's capability of performing across situations. The latter construct is conceptually similar to locus of control, as someone who believes in his or her personal capability to perform well is also likely to believe that he or she has enough control over life to do so (Bono & Judge, 2003). Judge, Van Vianen, and De Pater (2004) pointed out that all of the traits involve the degree to which one describes oneself positively. Judge et al. (2003) explained that possessing this broad core of positive self-regard manifests itself in each of the traits: high self-esteem, self-efficacy, emotional stability, and locus of control. Furthermore, Johnson, Rosen and Levy (2008) suggested, "one way that CSE ... might be improved is by conceptualizing the construct as being comprised of chronic beliefs about basic self-regulatory capacities" (p. 396). Thus, the traits are alike and closely tied to each other.

In addition to the conceptual similarities that the four traits share, a meta analysis conducted by Judge et al. (2003) demonstrated the empirical relationships between the traits, estimating the average population correlations between the traits to be .60 (see Appendix A for all of the correlations among the traits found by these authors). Bono and Judge (2003) commented that "it is clear from core self-evaluation research that these

traits are highly intercorrelated and exhibit strikingly similar relationships with other variables” (p. 14). Although some have argued that certain traits, such as locus of control or even self-esteem, are unnecessary as CSE components when studying various outcomes (e.g. Avery, 2003 and Johnson, Rosen, & Levy, 2008, respectively), there appears to be a significant amount of research to suggest that they should all be included, some of which will be reviewed here.

CSE as a Unidimensional Trait

When researchers are faced with the challenge of combining multiple traits into a single dimension, various statistical analyses are used to substantiate the presence of a higher order factor. Multiple exploratory and confirmatory factor analyses have indicated that the four CSE traits load on a single higher order factor. This indicates that the construct is in fact unidimensional and that a single higher order factor provides a better fit to the data than the individual components of CSE (Bono & Judge, 2003; Judge, 2009; Judge et al., 2003). However, a sufficient lack of redundancy remains amongst the four variables such that each component is “unique and important” (Judge et al., 2003, p. 304). In other words, the traits are not simply synonyms for one another.

Erez and Judge (2001) conducted a confirmatory factor analysis on data from three separate samples and found the average factor loading on the CSE construct to be .91 for self-esteem, .81 for self-efficacy, -.73 for neuroticism, and .72 for locus of control, which are all of a sufficiently high magnitude. As was demonstrated with these samples, self-esteem is generally the best indicator of CSE out of the four, while locus of control usually has the lowest factor loading (Bono & Judge, 2003).

The confirmatory factor analysis conducted by Judge, Bono, and Locke (2000) revealed that “self-esteem and self-efficacy were nearly perfectly correlated with the core self-evaluations factor” (p. 242). Locus of control was the least related to the overall concept, which, as previously stated, often seems to be the case in CSE studies. However, the authors found that removing the variable reduced the fit of the model, and thus determined that all four of the traits were necessary to complete the construct.

Judge et al. (2003) conducted an analysis in response to a concern about losing information about the specific traits from combining them. The authors used hierarchical regression to enter the CSE traits as predictors, with job satisfaction, life satisfaction, and job performance as the criterion variables. They entered each of the four traits as the first step, followed by a single score obtained from the CSES, a scale designed to assess all of the traits simultaneously, for the second step. They then reversed the order of the blocks, entering the CSES score first, followed by the four traits. Lastly, the authors compared the change in the multiple correlation between these regressions. The results indicated that “the CSES performs as well as the four traits,” because the same amount of information was retained and lost in each regression (p. 323). In the end, measuring the variables all together was deemed to be favorable compared to measuring the four traits separately because of the additional advantages from a single CSES score. For instance, the scale was able to display incremental validity when the individual CSE traits and five-factor traits were controlled for in predicting job satisfaction and performance (Judge et al., 2003).

Despite findings that suggest similarity amongst the traits, many researchers continue to study them in isolation. Erez and Judge (2001) noted that this was problematic because no single trait is usually a great predictor of job behavior independently. Judge, Van Vianen, and De Pater (2004) also commented that considering self-esteem and locus of control independently of each other “leads to underprediction and semantic confusion” (p. 327). Therefore, it is advisable for researchers to bear in mind the higher order factor that these traits fall into and investigate them simultaneously in future studies, while continuing to take into account the employee’s surrounding context (Heller, Judge, & Watson, 2002).

CSE as a Predictor of Non-Performance Outcomes

As a “broad latent concept,” CSE tends to be more predictive of outcomes than its individual components (Judge, 2009, p. 58). In fact, the validity of the CSE trait has often doubled that of any other core trait independently (Judge et al., 2003). Also, Judge, Heller, and Klinger (2008) found that CSE explained significant unique incremental variance in job satisfaction, while the Five Factor Model, positive affect, and negative affect did not. This finding suggests that CSE is not synonymous with the Big Five, positive affect, or negative affect. Lastly, a recent study suggested that the core self-evaluations concept added incremental variance in the prediction of physical and psychological health functioning above and beyond subjective well-being (Tsaousis, Nikolaou, Serdaris, & Judge, 2007).

Although CSE arose from a search for predictors of job satisfaction and many researchers have since demonstrated this relationship (e.g., Heller, Judge, & Watson,

2002; Judge & Bono, 2001; Judge et al., 1998), this construct has been found to be predictive of many other relevant work outcomes as well. Judge, Bono, and Locke (2000) demonstrated that people with greater CSE had more complex jobs along with higher levels of job satisfaction. The authors also discovered that perceived job characteristics (autonomy, feedback, task variety, identity, and significance, which were collapsed into a single dimension) mediated the relationship between CSE and job satisfaction. The authors hypothesized that these findings suggest that the complex jobs are “more challenging and intrinsically enriching” and could help explain why high-CSE individuals perceive their jobs to be more challenging and are more satisfied in these jobs (p. 247). In addition, Brunborg (2008) found that the higher the CSE scores in a sample of Norwegian employees, the lower their perceived job stress. In fact, self-evaluation was the “single strongest predictor variable of job stress in this study” (p. 100).

Results from another study indicated that CSE was negatively related to service provider burnout and perceived negative customer behaviors, and was positively related to a sense of personal accomplishment (Yagil, Luria, & Gal, 2008). A recent study conducted by Scott and Judge (2009) demonstrated the greater likelihood that high-CSE employees had of being popular in their workplace. These individuals also “reported receiving more citizenship behaviors and fewer counterproductive work behaviors from their coworkers” (p. 20).

Judge, Hurst, and Simon (2009) recently conducted a study to examine the effects that CSE, general mental ability, and physical attractiveness had on pecuniary outcomes. The results suggested that CSE was positively related to income and negatively related to

financial strain. Moreover, the trait had a greater effect on income than physical attractiveness, and nearly matched the magnitude of the intelligence-income relationship. Judge et al. (2009) stated that “the influence of core self- evaluations on both income and financial strain underlines the critical role it can play in both objective and subjective life success” (p. 749). The authors theorized that CSE is predictive of these outcomes because high-CSE individuals view their financial situations more positively; they are also less likely to experience financial strain resulting from expensive appearance- enhancing activities in an effort to increase self-concept.

Judge and Hurst (2007) have recently begun to investigate the interactions between CSE and other work variables. They conducted a longitudinal study to determine the extent to which CSE would predict midlife income. They also investigated whether family socioeconomic status (SES) and academic achievement would be related to earnings and how these variables interacted with each other. All three of the predictors— CSE, SES, and academic achievement—were found to be significantly related to midlife income. Additionally, CSE moderated the relationships between the other variables, such that higher SES and academic achievement made little difference in earnings for those with low CSE, while they had a large positive impact for individuals with high CSE. The authors commented that, “It seems that resources, such as family advantages, and positive CSE together are necessary to the attainment of above average levels of income” (Judge & Hurst, 2007, p. 1221). This provided further insight into how this personality characteristic can interact with environmental factors to predict important outcomes.

A separate study investigated the relationship between CSE and career growth trajectory, or the speed of success and advancement in a job. Those with high CSE were found to have higher initial levels of work and they also enjoyed steeper career growth trajectories. The authors discovered that these employees were also more likely to continue their education and to maintain their physical health, and conjectured that these factors may play a part in their work success (Judge & Hurst, 2008).

Other studies have linked CSE to greater life satisfaction and happiness, as well as less stress and strain (Bono & Judge, 2003). In a recent article reviewing the relationship between CSE and work success, Judge (2009) summarized that high CSE, “reflecting a positive self-concept, are related to a broad array of work and nonwork criteria, including increased levels of job and life satisfaction, better job performance, higher work motivation, and higher income” (p. 59). Thus, it appears that this construct has great value for both researchers and practitioners in a variety of domains.

CSE as a Predictor of Performance

Judge, Van Vianen and De Pater (2004) examined the extant research between CSE and job outcomes, highlighting the predictive validity of CSE relative to performance. Following the review, the authors concluded, “We believe the concept is, along with conscientiousness, the most useful personality trait in the realm of human performance” (Judge, Van Vianen, & De Pater, 2004, p. 342). Clearly, the CSE concept deserves additional attention from researchers and further inclusion in models with performance outcomes.

Judge and Bono (2001) conducted a meta-analysis with the purpose of examining the relationship that the CSE variables have with job performance. The review, which included 105 correlations, found the average corrected CSE- performance correlation to be .23. Although the figure may not appear to be remarkable at first glance, Bono and Judge (2003) observed that this is “exactly the same as the validity of conscientiousness in predicting job performance” (p. 9). This comparison demonstrates the significance of CSE as a valuable construct because conscientiousness is a personality dimension that has been consistently found to be predictive of a wide range of work outcomes across occupation types (Barrick & Mount, 1991). Judge (2009) also commented on the size of the relationships between CSE and various outcomes, including performance:

The correlations in these studies are ‘moderate’ in magnitude- mostly in the .20 to .40 range- and none of these studies argue that CSE is the only factor (or even the only trait) underlying these behaviors. Still, CSE appears to predict an impressive and diverse array of work and nonwork attitudes and behaviors. (p. 59)

Having reviewed the relationship between CSE and a variety of work variables including job performance, a case can now be made that this trait will likely predict academic performance as well. Previous research has already demonstrated the close relationship between job performance and academic performance, as measured by GPA (Roth, BeVier, Switzer, & Schippman, 1996). For example, Dyer (1987) conducted a study in which 970 students entering a nursing program completed various measures that were hypothesized to be predictive of job performance. The assessments included

personality tests, biographical inventories, and a vocational interest form; GPA and ACT scores were retrieved as well. The participants also completed these measures one year after their graduation. At that time, a 12- scale assessment was completed by each graduate's supervisor to assess his or her job performance. This form was designed to evaluate performance on aspects of the job including patient care, teaching ability, scientific knowledge, and communication and team work with colleagues. The results indicated that over 92 percent of the performance variance was explained when all inventories were entered into the regression equation. Additionally, GPA and the biographical inventory were found to be the best predictors of job performance (Dyer, 1987).

The present study proposes the hypothesis that CSE will be predictive of academic performance on the basis that CSE is predictive of job performance, which is tied to academic performance. The use of academic GPA, the typical measure of scholastic achievement, as a proxy for job performance in testing theoretical models is credible because academic and work settings are often analogous. Kuncel, Hezlett, and Ones (2004) noted that both involve learning as well as performing practical tasks. Additionally, both require the implementation of knowledge, skills, and abilities that must be obtained beforehand, as "performance in both academic and work settings is a direct function of learned declarative and procedural knowledge" (Kuncel, Hezlett, & Ones, 2004, p. 151). Therefore, it is plausible that the investigation of the relationships between CSE and performance with undergraduates in an academic setting could produce results comparable to those obtained in a field setting with incumbents.

CSE has been defined as a trait, and “as with all traits, the main source of core self- evaluations is genetic” (Judge, Hurst, & Simon, 2009, p. 744); therefore, the dispositional variable should be relatively stable across contexts. It is consequently hypothesized that a positive relationship will exist between CSE and measures of performance that are both broad and narrow. The present study assessed broad or general performance by examining GPA, a measure of overall academic achievement; narrow or domain-specific task performance was measured by the score on a single class test. This design allows an investigation of whether the CSE higher order personality variable affects both general and domain- specific performance equally.

However, the proposition has been made that broad personality constructs are better able to predict broad criteria (Ones & Viswesvaran, 1996), and that a match between the predictor and the criteria will increase validity (Hogan & Roberts, 1996). In accordance with this premise, it is hypothesized that the relationship that CSE has with general academic performance will be stronger than that with domain- specific performance, because CSE and general performance are matched in terms of breadth. Additionally, general academic performance could likely be a more stable assessment of performance than a single class exam as it quantifies a wide range of academic performance aspects. Thus, the greater reliability of GPA than an exam score as a performance measure further supports the hypothesis that the CSE- general academic performance relationship should be stronger than the CSE- domain-specific performance relationship. Therefore, the following hypotheses are proposed:

Hypothesis 1a: CSE will be positively related to domain-specific task performance.

Hypothesis 1b: CSE will be positively related to general academic performance.

Hypothesis 1c: The relationship between CSE and general academic performance will be stronger than the relationship between CSE and domain-specific task performance.

Motivation as a Partial Mediator of the CSE- Performance Relationship

A major criticism against personality assessments used in organizational settings revolves around the relatively small validity coefficients, which result in a large degree of unexplained outcome variance (Rosse, Miller, & Barnes, 1991). A recently published book edited by Smith and Schneider (2004) included contributions from a variety of authors regarding their appraisals of the role of personality in organizations. The editors ended the book with a chapter evaluating the trends and gaps in this field of research. Smith and Schneider (2004) reviewed the existing research and concluded that the low validity coefficients that are often found in studies examining the relationship between a personality variable and performance should not actually come as a surprise to researchers. The editors stated that the failure to explore the processes or mechanisms that mediate these relationships is a likely contributor to the subsequently low coefficients, and is one of the main deficiencies in the field.

One of the few attempts to explore such processes in personality- performance relationships was a noteworthy study conducted by Barrick, Stewart, and Piotrowski

(2002). Adapted measures to assess the Five Factor Model and motivation orientation were completed by 164 telemarketing sales representatives. Supervisors assessed each employee's performance in eight job aspects to create an overall job performance rating. The results suggested that the motivational intentions of achievement striving and status striving mediated the relationships between personality variables and performance ratings. Specifically, status striving mediated the extraversion- job performance relationship, and achievement striving mediated the relationship between conscientiousness and status striving; status striving was then predictive of performance.

The authors deemed the results of their study to be a contribution to existing research because of the inclusion of personality traits and motivational states in one model. Thus, these results increase current knowledge of the way in which personality influences performance. They noted that "these findings... underscore the central role of the individual in determining his or her level of success at work" (Barrick et al., 2002, p. 49). Additionally, the results lend credence to better understanding the processes that link personality variables to job performance (Barrick et al., 2002).

Judge, Erez, and Bono (1998) also theorized that motivation is the way in which the relationship between CSE and task performance operates. Specifically, they conjectured that individuals with high evaluations of themselves would feel more confident in their abilities and more likely to view a challenge in a positive light, leading to higher motivation. Evidence to support this hypothesis followed a few years later when Erez and Judge (2001) used both lab and field samples to demonstrate that the CSE-performance relationship was partially mediated by motivation. The lab sample consisted

of 112 undergraduate students who completed anagrams as a performance measure. Motivation was measured by time invested in anagram completion and responses to a three self-report questionnaire items, e.g., “I did not perform as well as I could because I was not motivated to do well” and “I really wanted to succeed on this test” (p. 1272). The results indicated that student task motivation acted as a partial mediator in the relationship between CSE and performance; those with positive CSE were also found to be more motivated than their negative- CSE counterparts.

The field sample in this study was comprised of 124 insurance agents, whose performance was appraised through supervisor ratings and total annual sales. Motivation was assessed with goal setting and goal commitment self-report items, e.g., “My sales goals that I have set for myself are difficult to achieve” and “I am strongly committed to pursuing my sales goals,” respectively (p.1274). Summed activity level also served as a motivation proxy. The results of this study indicated that core self-evaluations were strongly related to goal-setting motivations as well as to both measures of performance. Goal-setting motivation also predicted activity level, which in turn, was predictive of both productivity and rated performance, making these forms of motivation a CSE-performance mediator. Additionally, the results remained significant even when controlling for conscientiousness, further supporting the use of the CSE construct in addition to Big Five measures. Lastly, CSE was a stronger predictor of the outcomes than any one trait independently. In fact, the overall construct “correlated .12 more strongly with motivation and performance than did the average core trait,” consistent with the higher order nature of the CSE concept (Erez & Judge, 2001, p. 1277). In a review of

CSE- job performance literature, Bono and Judge (2003) referenced this study and noted that “on average, roughly half of the relationship between core self-evaluations and performance was mediated by motivation” which is a sizeable percentage of the relationship (p. 9). They also theorized that other forms of motivation such as self-determination might account for the remaining variance between CSE and performance.

Other researchers interested in the mechanism behind CSE- performance relationships have put forth various theories to explain these correlations. Such hypotheses include the idea that supervisory performance ratings of high CSE employees are inflated due to the general likability that may be associated with that trait (Bono & Judge, 2003), or that in some situations CSE acts as an ability factor and helps employees to solve problems better (Judge, Erez, & Bono, 1998). Others have surmised that the positive effects that high CSE has on coping abilities or tolerating stress could buffer work challenges, which would result in less negative impact on high- CSE employees than low- CSE employees (Bono & Judge, 2003). Other speculations revolve around self-verification theory, which “indicates that individuals seek to verify their self-concepts by selecting situations that will supply them with feedback that reinforces their self-concept” (Judge, Bono, & Locke, 2000, p. 239). Judge and Bono (2001) also detailed theoretical reasons that CSE could be related to performance according to self-consistency theory, theories of learned helplessness, and control theory in their meta-analysis of CSE- performance relationships.

Although there are many theories under which the CSE- performance could be investigated, the models involving motivational states as mediators seem particularly

promising. However, research involving these variables has been limited, and the previously stated notion that unexplored forms of motivation could account for additional variance in this relationship has not been adequately addressed (Bono & Judge, 2003). One such form of motivation that has not been tested to date is engagement.

Engagement as a CSE- performance mediator makes conceptual sense because firstly, one type of motivation has already been demonstrated to mediate these constructs (i.e. goal setting motivation; Erez & Judge, 2001), making it a logical decision to investigate other motivational states to test whether these relationships could be generalizable. Secondly, the very nature of the engagement construct allows for theoretical links between the variables. Engagement is characterized by a commitment to performance, and consequently, could likely to lead to that very outcome. Additionally, components of engagement are depicted very similarly to the four traits that comprise CSE, and should therefore likely to be related to them. These conceptual relationships will be further detailed below, lending credence to the novel investigation of engagement as a CSE- performance mediator. The present study will review existing research on this motivational state and will specify empirical evidence suggesting that this variable mediates the relationship between CSE and performance.

Engagement as a Motivational State

Conceptualizations of Engagement

The motivational state of engagement is defined as a commitment to superior performance that arises from a sense of personal responsibility. This feeling of responsibility ties the identity of the worker to his or her performance outcomes and

provides a sense that superior task performance really matters to the employee (Britt, 2003b; Britt, Dickinson, Greene, & McKibben, 2007; Britt et al., in press). Additionally, the greater an individual internalizes a goal, such as superior performance, the more effort he or she should exert to achieve it. This extra effort is a manifestation of the individual's heightened motivational state and results in a more drastic change in psychological well-being when the goal is or is not met (Burton, Lydon, D'Alessandro, & Koestner, 2006).

In its short research history, engagement has been conceptualized numerous ways and with various facets. Britt, Dickenson, Greene, and McKibben (2007) provided a brief review of its operationalizations: in 1990, Kahn found that engagement had the tendency to fluctuate within a person and therefore the construct could not conclusively be categorized as an individual difference. In 2001, Rothbard expressed the view that engagement is comprised of attention and absorption factors. In the same year, Maslach, Schaufeli, and Leiter described job engagement as the opposite of burnout, with the two at opposite ends of a continuum. A frequently-cited Schaufeli et al. study published in 2002 labeled engagement as a positive state of mind with factors of vigor, absorption, and dedication. He also refuted Maslach, Schaufeli, and Leiter's (2001) engagement-burnout continuum theory and argued that the two were separate but related constructs. Lastly, Harter, Schmidt, and Keyes (2003) stated that engagement is composed of various cognitive and emotional variables.

Macey and Schneider (2008) recently published an article specifically to address the "competing and inconsistent interpretations" of the employee engagement construct

(p.3). The authors presented a framework in which engagement has trait, state, and behavioral components, with 14 propositions elucidating extant engagement research. The researchers theorized that state engagement is predicted by trait engagement and is also an antecedent of behavioral engagement, making this component central to the framework. These propositions that were put forward identified multiple facets of state engagement which have often been mistakenly used synonymously with the construct. The authors summarized:

State engagement concerns PA associated with the job and the work setting connoting or explicitly indicating feelings of persistence, vigor, energy, dedication, absorption, enthusiasm, alertness, and pride. As such, state engagement has components of organizational commitment, job involvement, and the positive affectivity components of job satisfaction. (p.24)

Macey and Schneider go on to note that the sense of self-identity employees have pertaining to their work is also a factor of state engagement. The authors explained that "it is from the experience of being psychologically present in the work—that the work is a part of one's identity—that employee development and productivity follow" (p. 12). Although these authors did not provide a conclusive definition of the construct, they did detail a thorough conceptual framework of engagement for researchers and practitioners to use as a starting point for further exploration and clarification.

Alternatively, Britt and his colleagues (2003a; in press) have conceptualized engagement more narrowly than most researchers, and have identified work conditions that promote high engagement. These factors include clear task guidelines, high

relevance of the task to the worker's identity, the worker having control over his or her performance, and the importance of the task. Despite the variations between the different definitions of the engagement construct, Britt, Dickinson, Greene, and McKibben (2007) noted that they are still similar in that they "all emphasize that job engagement entails the individual being dedicated to successful performance through emotional investment in performance" (p. 146). This dedication and investment in performance appears to be the essence of the engagement construct.

Engagement as a Predictor of Performance

It is intuitive that a motivational state characterized by a dedication to success and performance is likely to lead to the attainment of these very goals. Empirical evidence from recent studies supports this relationship, further strengthening the supposition. For instance, Britt et al. (in press) found that those who scored higher on an engagement measure before the 2004 presidential election were much more likely to actually vote in the election. Two other similar studies were also conducted by Britt et al. (in press), who examined the relationship between task engagement and performance, operationalized by test scores in the first study and the completion of a personal project in the second.

Following the voting study, the second study in this article included 145 undergraduate students who completed a self-report measure of test engagement two to four days before their second test of the semester in an introductory psychology class. The students also indicated the test score they expected to receive; actual test scores were later obtained from the professor. Additionally, the students completed a measure of

performance self-esteem before they took the test, which they also completed on the day they received their test grades.

The results indicated that those who reported high test engagement significantly outperformed those with lower test engagement. The students who were highly engaged in the test also reported higher self-esteem when their expected test score and actual test score were close together. The authors noted that “the results of the present study provide further support for task engagement as a predictor of performance and emotional responses to performance outcomes” (Britt, et al., in press, p. 16).

The third study reported in this same article involved 90 undergraduate students who were instructed to describe two personal projects, which were goals that were not required of the students but were ones they intended to carry out during the semester. Engagement in these projects was assessed during the first third of the semester. The measure was designed to evaluate the degree to which the student felt responsible for the project, how absorbed the individual was likely to be in the project, and the extent to which the project mattered to the student. In the last two weeks of the semester, the students returned to answer questions about the completion of their projects and their emotional responses regarding it.

The results revealed an interaction between engagement in the project and the complexity of the project, such that engagement was only predictive of the probability of project completion when the project was at a high level of complexity. The authors noted that because many of the projects were fairly simple they did not require a high degree of motivation to be completed, thus the engagement factor was not as important in these

circumstances. The results also suggested that high levels of engagement boosted positive emotions when performance was also high. This research showed that engagement was predictive of a range of performance domains in varied contexts. Similarly, the present study, which examined academic engagement in both general and domain-specific circumstances, could enhance current understanding of the conditions and degree to which engagement and performance are related to each other.

Although engagement is often studied in reference to job performance, it is possible to be engaged in any number of activities. To be engaged in an action only requires that the task matters to the individual and that he or she is committed to the task and feels responsible for its outcome (Britt, Dickinson, Greene, & McKibben, 2007). Researchers have studied engagement in narrow domains, such as a single university course (e.g., Handelsman, Briggs, Sullivan, & Towler, 2005), ranging to broad domains, such as work or daily life (e.g., Martin, 2008). Unlike a trait, which is relatively constant across contexts, engagement as a motivational state is always in reference to a particular task or setting.

The relationship between engagement and performance has been demonstrated recently in an academic setting (Britt, et al., in press). The present study examines engagement in both broad and narrow domains by examining its relationship with two measures of performance. Engagement in studying for a particular class exam is hypothesized to be related to performance on the exam as measured by the test score. In contrast, overall academic engagement is hypothesized to be predictive of overall

university performance as measured by student GPA. Therefore, the following hypotheses are proposed:

Hypothesis 2a: Domain-specific engagement will be positively related to domain-specific task performance.

Hypothesis 2b: General academic engagement will be positively related to general academic performance.

CSE as a Predictor of Engagement

In addition to a narrower definition of engagement, another way in which Britt and his colleagues have contrasted some of the previous definitions is by identifying variables that others have labeled as characteristics of the state, and have conceptualized them as antecedents instead. For instance, in 2001, Maslach et al. cited efficacy at work as an indication of engagement, and in 2003, Harter, Schmidt, and Keyes claimed that having the resources necessary to succeed fell into the same category, whereas Britt et al. view these variables as *predictors* of engagement.

Some of the antecedents that have been identified are very similar to CSE variables. For instance, the authors note that “being involved in personally meaningful work and feeling confident at being able to execute performance were related to job engagement” (Britt, Dickinson, Greene, & McKibben, 2007, p. 150). The confidence in one’s abilities and the belief that one has the necessary resources to do well are in line with the concepts of self-efficacy and self-esteem. Additionally, the “strong sense of personal control and contribution for their performance” is almost identical to the definition of internal locus of control (Britt, Dickinson, Greene, & McKibben, 2007, p.

148). Upon reviewing existing engagement literature, Britt, Dickinson, Greene, and McKibben (2007) called attention to the relationship between high levels of work engagement and “performing work consistent with one’s identity, which is therefore personally meaningful” (p. 150). A CSE would undoubtedly be a large part of one’s identity, since it is essentially an appraisal of oneself. Thus, the possession of high self-esteem and self-efficacy along with emotional stability and a belief in one’s ability to control the path to success is very likely to be significantly related to engagement. As in the first set of hypotheses, the relationship between CSE and a broadly measured variable is theorized to be stronger than the relationship CSE should have with a narrowly measured variable. Therefore, the following hypotheses are proposed:

Hypothesis 3a: CSE will be positively related to domain-specific engagement.

Hypothesis 3b: CSE will be positively related to general academic engagement.

Hypothesis 3c: The relationship between CSE and general academic engagement will be stronger than the relationship between CSE and domain-specific engagement.

Evidence supporting the hypotheses that engagement and CSE are predictive of performance has already been detailed, and results suggesting that CSE will be an antecedent to engagement were reviewed. These relationships together comprise a mediated relationship in which CSE will be related to engagement, which will in turn be predictive of performance (see Figure 1).

Given the relationships that CSE is theorized to demonstrate with engagement and performance, and the hypothesized link between engagement and performance, the following hypotheses are proposed:

Hypothesis 4a: The relationship between CSE and domain-specific task performance will be partially mediated by domain-specific task engagement.

Hypothesis 4b: The relationship between CSE and general task performance will be partially mediated by general academic engagement.

Need for Achievement

Need for Achievement as a Potential Missing Link

The relationship between CSE and performance has been established in a number of studies (Erez & Judge, 2001; Judge & Bono, 2001; Judge, Erez, & Bono, 1998; Judge & Hurst 2007), yet these relationships have not always been demonstrated to be as strong as one might expect. Although Judge (2009) argued that the correlations between CSE and performance are impressive, there are likely other traits that moderate the relationship so that the correlations will be stronger under certain conditions. An individual's need for achievement (nAch), or achievement motivation, is hypothesized to be such a trait. Although research on this construct has appeared as early as 1910, McClelland is most noted for work on the nAch, along with the need for power and the need for affiliation (Singh, 1979). On April 4, 2009, a PsychInfo search produced over 5,000 articles on the construct as well as over 70 instruments to measure it.¹

The many researchers who have studied this topic have slightly different definitions of nAch, but it has been “traditionally conceptualized as a unitary disposition that motivates a person to face challenges in the interest of attaining success and excellence” (Sagie, 1994, p. 51). Those who are highly achievement motivated are characterized by setting difficult personal goals and accepting responsibility for whether these goals are accomplished (Spangler, House, & Palrecha, 2004). Such goals are evaluated by the individual to determine the goal’s difficulty, importance, and the degree of effort it will require to achieve (James & Rentsch, 2004). Those who score high in the nAch also have a tendency to try to outperform other individuals or exceed set standards (Schmidt & Frieze, 1997).

Need for Achievement as a Moderator of the CSE- Engagement Relationship

As previously hypothesized, an individual with high CSE is more likely to have greater engagement in both general and task-specific domains, as trait-like variables such as CSE are characterized by their stability across contexts. It is possible, however, that an employee might possess all the components of CSE - emotional stability, self-esteem, self-efficacy, and an internal locus of control - yet not become highly engaged a given task. Just as someone with all of the necessary *skills* to succeed will not do so unless the necessary effort is invested, so will the individual also not become highly engaged unless the *drive* to succeed is present. Although the possession of high CSE is hypothesized to be predictive of high levels of this motivational state, this relationship is not likely to be as strong without the presence of the nAch to stimulate it. Thus, engagement should be especially strong for an individual high in both nAch and CSE. This increased

engagement should, in turn, lead to increased performance in that domain (i.e., academic engagement producing a higher GPA, and test engagement producing a higher exam score).

The specific domain of test performance is part of the larger domain of academic performance, which is hypothesized to be predicted by engagement, CSE, and nAch. The academic performance domain is comprised of narrow domains, including test performance; a significant relationship in this broad domain is therefore likely to be present in the narrow domain. However, the higher order personality variables are broad in scope, and are thus hypothesized to have a greater relationship with overall performance than with domain- specific performance. Therefore, the following hypotheses are proposed:

Hypothesis 5a: nAch will moderate the relationship between CSE and domain-specific engagement, such that the relationship between CSE and domain- specific engagement will be stronger when nAch is high.

Hypothesis 5b: nAch will moderate the relationship between CSE and general academic engagement, such that the relationship between CSE and general academic engagement will be stronger when nAch is high.

The series of relationships in the proposed model frame a process known as moderated mediation, because the proposed overall effect of CSE and engagement on the performance outcome is dependent on the nAch moderator (Muller, Judd, & Yzerbyt, 2005). A moderated mediation model is a valuable tool because it attempts to explain both *how* and *when* the relationships occur (Frone, 1999). "Moderated mediation happens

if the mediating process [engagement] that is responsible for producing the effect of the treatment [CSE] on the outcome [performance] depends on the value of a moderator variable [nAch]" (Muller, Judd, & Yzerbyt, 2005, p. 854, text in brackets added). In other words, the relationship between CSE and performance as mediated through engagement (in both broad and narrow domains) is dependent on how the nAch moderates the CSE- engagement relationship. Because the presence of the nAch variable changes the magnitude of engagement, the level of performance is consequently indirectly dependent on nAch as well. Therefore, when CSE and engagement are high, they are hypothesized to produce greater performance. This effect should be amplified when nAch is also high, but will be diminished when nAch is low. The same effects should result if CSE is low and nAch is high. Again, elevated engagement is most likely to result when both nAch *and* CSE are high; this increase in the motivational state is then hypothesized to be predictive of greater performance.

The presence of moderated mediation in a model can be detected by controlling for either the moderator or the mediator. Two criteria must be fulfilled to establish moderated mediation: a greater amount of outcome variance should be explained firstly, when the mediator is included and secondly, when the moderator is included in the model. It is hypothesized that CSE and nAch interact to predict performance, and that including engagement in the model as a mediator should account for more performance variance than that is explained without it. Without engagement, the effect of the CSE - nAch interaction on performance is weakened; this indicates moderated mediation. Similarly, nAch is hypothesized to moderate the CSE- performance relationship, and

including nAch in the model as a moderator should also account for more performance variance than when it is excluded. The effect of the CSE- engagement mediation on performance should be consequently weakened without the presence of nAch, fulfilling the requirements of moderated mediation (Muller, Judd, & Yzerbyt, 2005).

CHAPTER TWO

METHOD

Participants & Procedure

A total of 594 usable questionnaires were collected from participants, all of whom were undergraduate students in three psychology classes at Clemson University. The majority of participants were in an introductory psychology class (85%); 9% were in a psychology statistics course, and the remaining 6% of students were in a personality psychology class.²

Demographic information that was requested from the participants included gender, age, ethnicity, and year in school (see Appendix D). The gender of the students was split fairly evenly (46% male, 51% female, 3% did not report their gender). There was a wider age range than was initially expected; as anticipated, however, the majority of the students were 18 (60%) or 19 (21%) years old. The survey was also taken by those who were 21 (4%), 22 (1%), and less than 1% of those who were 23, 24, 25, 28, or 37. The large majority of students were White/ Caucasian (86%), followed by African-American (7%), Other (2%), Hispanic American/ Origin (2%), Asian- American (1%), American- Indian (< 1%) and Hawaiian/ Pacific Islander (< 1%); 5% did not indicate their ethnicity. Approximately two-thirds of the participants were freshman (64%), followed by sophomores (20%), juniors (8%), seniors (6%), and graduate students (<1%); 2% of the participants failed to indicate their year in college.

Surveys were distributed to entire psychology classes four days prior to the first class exam of the semester (the Friday before a Monday exam). The students were

informed that they were not obligated to participate; participants received extra credit or research credit for their involvement at the discretion of their professor (see Appendix B). Participants were also reassured that all responses were confidential and would only be used for research purposes.

Measures

The measures in the survey consisted of the CSE, nAch, and two engagement measures; the scale scores for each of these were created by averaging the item scores. The survey also included consent forms for the researchers to obtain each participant's GPA and test score.

Core self-evaluations. CSE was assessed using the 12-item CSE scale (CSES) developed and validated by Judge et al. (2003). The items from this scale were designed to measure an individual's self-regard by assessing self-esteem, self-efficacy, locus of control, and neuroticism simultaneously. A four-sample study conducted by Judge et al. (2003) found the average internal consistency of the scale to be .84 and the test-retest or stability of the test to be .81. Respondents indicated the degree to which they agreed with a statement on a five-point scale ranging from "strongly disagree" to "strongly agree." Six items are positively scored, e.g., "I am confident I get the success I deserve in life," and six are reverse scored, e.g., "I am filled with doubts about my competence" (see Appendix E). The higher the CSES score, the greater the participant's "appraisal of [his or her own] worthiness, effectiveness, and capability as a person" (Judge et al., 2003, p. 304). Providing evidence of predictive validity, the CSES has been consistently related to

outcomes such as job performance, job satisfaction, and life satisfaction (Judge et al., 2003).

Need for achievement. An adapted version of the 14-item short form of the Ray Achievement Motivation Scale, which was validated cross-culturally, was used to assess nAch (Ray, 1979).³ The 14-item version was tested on two British samples and three Australian samples and was deemed to have sufficient reliability, with Cronbach alphas ranging from .72 to .79 (Ray, 1979). The original three-point scale with the “yes,” “no,” or “neutral” response format was expanded to five anchors for the present study to enable a greater degree of variability. In this modified version, respondents indicated whether they agreed with a statement on a five-point scale, ranging from “strongly disagree” to “strongly agree.” Some items were slightly altered to be applicable and understandable to students, i.e., “Are you satisfied to be no better than most people at your job?” was changed to “I am satisfied to be no better than most other people in school” and “Is ‘getting on’ in life important to you?” was changed to “Being successful in life is important to me” (see Appendix F).

Engagement. A modified version of the engagement scale developed by Britt and colleagues (in press) was used to assess engagement. Participants indicated the degree to which they agreed with statements on a five-point scale ranging from “strongly agree” to “strongly disagree.” In a study conducted by Britt, Adler, and Bartone (2001) involving 161 US Soldiers, the estimated Cronbachs alpha for the six-item version of the scale was .91. This engagement scale has been found to be predictive of test performance in college students (Britt et al., in press) and leadership performance in reserve officer training

corps cadets (Britt, Thomas, & Dawson, 1996). The five-item scale was used twice in the present study in order to evaluate both general (overall academic) and domain-specific (a single psychology test) engagement. The wording of the items was slightly modified to assess academic performance instead of job performance (see Appendix G and Appendix H). For example, the original scale item “I am committed to performing well at my job” was replaced by “I am committed to performing well as a college student” and “I am committed to performing well on the upcoming psychology test.”

Performance. Domain- specific performance was operationalized with a single exam score from a test in one of three psychology courses. The test scores from the exams, which were obtained from the respective professors after the test was graded, were acquired for 95% of the participants. Cumulative GPA retrieved from the university at the beginning of the fall semester served as a proxy for general academic performance. Only 27% of the participants’ GPA was accessible, as a large portion of the students were freshmen or transfer students, and cumulative GPA from at least one year in college could not be obtained for these participants. Students indicated their permission for the researchers to obtain their GPA as of August 2009 from the registrar and their test score from their professor in the consent form portion of the survey (see Appendix C).

CHAPTER THREE

RESULTS

The data were screened for univariate outliers prior to any statistical analyses; however, no significant outliers were detected and the data set remained intact.

Descriptive Statistics

The means, standard deviations, inter-correlations, and Cronbach alphas are presented in Table 1 (see Appendix I). As is evident in this table, the CSES was the only scale that reached the traditional reliability standard of .80, although the other three scales were all above .70 and therefore acceptable (nAch alpha = .76, domain engagement alpha = .79, general engagement alpha = .75). The average participant was toward the lower end of the age range ($M = 18.71$), since the large majority of the students who participated in the study were freshman.

As detailed in the Measures section, the CSE, nAch, and engagement scales were all assessed using a five-point scale. The mean scores on the CSES ($M = 3.69$, $SD = .50$) and the nAch assessment ($M = 3.69$, $SD = .45$) were above the midpoint of the scale and had fairly low standard deviations. The mean engagement scores were very high and also had low standard deviations (domain engagement $M = 4.28$, $SD = .48$, general engagement $M = 4.44$, $SD = .41$), an indication of a range restriction. The average test score from the respective psychology tests was 81.36 ($SD = 12.45$), and the mean GPA, which was on a 4.0 scale, was 3.05 ($SD = .58$).

Correlational Analyses

CSE and nAch were positively correlated ($r = .23, p < .001$), providing support for the theoretical link between the two constructs. Support was also obtained for the theorized connection between nAch and engagement, as the personality trait was significantly related to both general engagement ($r = .53, p < .001$) and domain engagement ($r = .42, p < .001$). The two engagement measures were strongly correlated with one another ($r = .71, p < .001$), and the two performance measures were moderately correlated ($r = .38, p < .001$).

Hypothesis 1a-c. A correlation was used to test hypotheses 1a-b, which stated that CSE would be positively related to domain-specific and general academic performance, respectively. The results suggested that CSE was not significantly correlated with either test score ($r = -.01, p = .91$) or GPA ($r = -.07, p = .37$). Thus, hypothesis 1a and 1b were not supported.

Hypothesis 1c stated that the relationship between CSE and general academic performance would be stronger than the relationship between CSE and domain-specific task performance. Because neither of these relationships was significant, however, this hypothesis was not tested, as the comparison of the magnitude of two relationships would not be meaningful if these relationships did not reach statistical significance in the first place.

Hypothesis 2a-b. A correlation was conducted to determine whether engagement was predictive of performance in the respective domains (hypothesis 2a-b). The results indicated that domain-specific engagement was not significantly correlated with test score ($r = .02, p = .686$), failing to support hypothesis 2a. However, general academic

engagement was significantly correlated with GPA, supporting hypothesis 2b ($r = .20, p = .012$).

Additional exploratory correlations were conducted to investigate whether engagement and performance were related across domains. The analysis indicated that domain-specific engagement was not related to GPA ($r = -.06, p = .445$). The general academic engagement- test score correlation also failed to reach statistical significance ($r = .03, p = .501$), despite the fact that it did exhibit a significant relationship with GPA.

Hypothesis 3a-c. The third set of hypotheses concerned CSE's theorized positive relationship with engagement. The results of another correlation indicated that CSE was not significantly related to domain engagement ($r = .05, p = .192$). Thus, hypothesis 3a was not supported. However, the results suggested that CSE was significantly correlated with general academic engagement ($r = .16, p < .001$), supporting the direct relationship posed in hypothesis 3b.

Hypothesis 3c stated that the relationship between CSE and general academic engagement would be stronger than the relationship between CSE and domain-specific engagement. The assumption was made that because CSE, a broad, higher-order trait would be more likely to be related to a broad measure of engagement than a domain-specific one. A test for the equality of two dependent correlations was required in order to compare these relationships, as they share the CSE variable and are from the same sample. A Steiger's Z- test was conducted since this test has been argued to be the most accurate test of its type (Meng, Rosenthal, & Rubin, 1992; Steiger, 1980). The results showed that the CSE- academic engagement correlation was significantly greater than the

CSE- domain engagement correlation, $t(591) = -3.57, p < .01$; thus, hypothesis 3c was supported.

Hypothesis 4a-b. Hypotheses 4a-b stated that the relationship between CSE and performance would be partially mediated by engagement within the respective domains. However, these hypotheses could not be tested, as there was not a significant relationship between CSE and either performance measure, thereby violating the first condition for the Sobel test of mediation (MacKinnon, Warsi, & Dwyer, 1995).

Multiple Regression Analyses

Prior to inclusion in the multiple regressions, all independent variables were mean- centered, a process that has been argued to reduce multicollinearity effects (Cronbach, 1987). Mean- centering is an important step when conducting a multiple regression analysis that includes an interaction term. This process allows a more meaningful interpretation of the first-order regression coefficient of predictors because it enables an identification of “the effects of the individual predictors at the mean of the sample, and [the] average effects of each individual predictors across the range of the other variables” (Cohen, Cohen, West & Aiken, 2003, p. 266).

Hypothesis 5a-b. A series of hierarchical multiple regressions were conducted in order to investigate whether nAch moderated the CSE- engagement relationships. This analysis involved creating an interaction term between CSE and nAch, which is the product of these two variables. The individual CSE and nAch terms were entered as the first block in the hierarchical multiple regression; the second block consisted of these two terms in addition to the CSE*nAch interaction term. This allows the individual main

effect terms to be controlled and enables the effect that is solely due to the interaction to be identified.

Domain-specific engagement was the first outcome variable included in the analysis. The results suggested that when CSE and nAch were entered at Step 1, they explained 17.7% of the variance in domain-specific engagement. (However, it is important to note that this variance is entirely contained within nAch because CSE was not significantly related to domain-specific engagement, as reported earlier.) The interaction of CSE*nAch entered in Step 2 did not reach statistical significance, $\beta = .02$, $t(576) = .467$, $p = .641$. Because the inclusion of the interaction term did not explain additional outcome variance, hypothesis 5a was not supported (see Table 2).

General academic engagement was entered as the outcome in the second hierarchical multiple regression. The results revealed that when CSE and nAch were entered at Step 1, they explained 28.6% of the variance in general engagement. As in the previous test, the interaction of CSE*nAch entered in Step 2 did not achieve statistical significance, $\beta = -.01$, $t(569) = -.350$, $p = .722$. Therefore, no additional outcome variance was explained when the interaction was added to the model. Thus, hypothesis 3b was not supported (see Table 3).

The present study proposed a series of hypothesized relationships that together, formed a moderated mediation model. While some individual components of the model were supported, other relationships that failed to reach statistical significance prevented the moderated mediation from occurring. Namely, the inability to demonstrate direct CSE- performance relationships violated a condition for a formal test of mediation.

Furthermore, the hypothesis that CSE and nAch would interact to predict engagement could not be tested in the domain-specific level because CSE was not a significant antecedent of test engagement. Lastly, despite the fact that the CSE was a significant predictor of overall academic engagement directly, the CSE*nAch interaction did not reach significance when entered as a predictor of academic engagement. Thus, the theorized moderation in the model could also not be supported.

CHAPTER FOUR

DISCUSSION

The present study tested the relationships between two personality variables- core self-evaluations and need for achievement- with performance, as mediated by the motivational state of engagement. A total of five sets of hypotheses were proposed, which together formed a moderated mediation model. Despite sound conceptual reasoning for the proposed relationships between these constructs, few of the hypotheses were supported by the data. Each of these hypotheses will be further discussed below in an exploration of possible reasons for the reported results. Lastly, limitations of the present study and directions for future research will be presented.

Implications of the Current Study

Hypothesis 1a-c. The first objective of the present paper was to establish a positive direct relationship between CSE and domain-specific task performance as well as between CSE and general academic performance. Previous findings supported a CSE-performance link in applied settings (Judge & Bono, 2001). In addition, literature supported the close relationship between job and academic performance, providing a foundation for testing the hypotheses with a student sample (Roth, BeVier, Switzer, & Schippman, 1996). Kuncel, Hezlett, and Ones (2004) noted the similarities between the requirements of the classroom and the workplace, including the implementation of knowledge, skills, and abilities. Thus, it was hypothesized that the relationship between CSE and academic performance would replicate the significant CSE- job performance relationships found in from previous studies. However, the results of the present study

suggested that CSE did not have a direct relationship with either performance domain, failing to support the first two hypotheses. Consequently, the choice was made not to test hypothesis 1c, which theorized a stronger CSE- general academic performance relationship as compared to the CSE- domain-specific performance relationship. Given that neither relationship reached statistical significance, it was believed that this comparison would not be meaningful.

The results of the present study are inconsistent with a relatively large body of research demonstrating a significant CSE- performance relationship. As previously cited, Judge and Bono's (2001) meta-analysis, which included 105 correlations, found CSE and performance to have an average correlation of .23. Findings such as this served as a basis for the first set of hypotheses. However, one of the criteria for inclusion in their meta-analysis was the use of employed adult participants, whereas the present study involved an undergraduate student sample with an average age of 18.7 years old. The dissimilarity in the performance construct as assessed in applied versus academic settings may partially explain the non-significant relationships stated in the second and third set of hypotheses. Although research was reviewed indicating that a case could be made for the similarity of the two samples, it is possible that they are more disparate than anticipated.

Namely, job performance in an applied setting may typically be assessed more comprehensively than our performance measures for academics. A performance appraisal from a company likely encompasses a wide range of dimensions, whereas performance was operationalized in the present study solely with grade-based measures. Perhaps if performance had been measured more broadly, more hypothesized relationships would

have been significant. For instance, a study conducted by Schmitt et al. (2009) used twelve facets to assess university performance, including ethics and integrity, leadership, and interpersonal skills, all of which might be implicit in a job performance measure.

Thus, the lack of support for the CSE- performance relationship in the present study does not *disprove* the relationship between these constructs, although it may provide evidence to *qualify* it. Namely, performance of adults as measured in an applied setting may not be sufficiently comparable to performance of college students in an academic setting (at least when measured by test score or GPA) for its nomological network to transfer across settings.

Hypothesis 2a-b. The second objective was to demonstrate a direct relationship between engagement and performance in their respective domains. While the academic engagement – GPA relationship reached statistical significance, the domain-specific engagement – test score relationship failed to do so, providing partial support for this set of hypotheses. As in the first set of hypotheses, perhaps the latter relationship would have achieved statistical significance if performance had been measured more broadly. It is also possible that the engagement scale may have contributed to non-significant findings, which will be detailed below.

Hypothesis 3a-c. The third objective was to ascertain whether a direct relationship between CSE and each engagement domain existed. Similar to the second set of hypotheses, only the relationship in the broad domain (CSE- academic engagement) was significant. This finding is in line with the theory that a broader measure of engagement should be more closely related to a wide-ranging measure of performance (i.e., GPA)

than a domain-specific one (i.e., test score). The final hypothesis theorized that the CSE-academic engagement relationship would be stronger than the CSE- domain engagement relationship; this hypothesis was supported by the results. These findings, along with the relationship that general academic engagement exhibited with both CSE and nAch, seem to support hypothesized relationships primarily within the general academic domain.

This effect may be because the overall academic domain was determined by multiple indicators, and may be more stable than the domain-specific condition, which was represented by a single indicator. Engagement and performance on individual tests seem more likely to fluctuate to a much greater degree than overall engagement and performance in college. Because personality traits such as CSE and nAch are characterized by their stability, it makes sense that these variables were more highly related to the general academic engagement, as compared to engagement in a particular test. This is in line with the proposition that broad personality constructs are better able to predict broad criteria (Ones & Viswesvaran, 1996), and that a match between the predictor and the criteria will increase validity (Hogan & Roberts, 1996). Future studies should continue to explore these relationships in a range of contexts with varying specificity to determine how and when these variables are related to each other, which is the underlying purpose of a moderated mediation model (Frone, 1999).

Hypothesis 4a-b. The fourth objective of the present study was to establish partial mediation of the CSE- performance relationships by the respective engagement domains. It was theorized that CSE would be related to engagement due to the conceptual similarities between the constructs, such as an element of self-efficacy and a sense of

personal control (Maslach et al., 2001; Britt, Dickinson, Greene, & McKibben, 2007). Engagement was then theorized to be linked to performance on the basis that this motivational state is characterized by a dedication to success and superior performance (Britt et al., in press). Although CSE was related to general academic engagement, which was then linked to overall academic performance (GPA), CSE was not directly related to performance. This violated a condition for the Sobel test of mediation; thus, these hypotheses could not be formally tested nor supported (MacKinnon, Warsi, & Dwyer, 1995).

Judge, Erez, and Bono (1998) theorized that motivation is the mechanism that explains the relationship between CSE and task performance. In the present study, motivation was operationalized as engagement, which failed to produce significant mediation results. However, another measure of motivation could potentially have operated in a different way; namely, it is possible that the CSE*nAch interaction could have predicted another form of motivation. For instance, Erez and Judge (2001) assessed motivation with goal setting and goal commitment self-report items. One of the items that these authors used to assess this motivational state was “I did not perform as well as I could because I was not motivated to do well.” The engagement measure in the present study attempted to assess motivation less directly, however (e.g., “I am committed to performing well as a college student”). Perhaps a more outright and specific evaluation of motivation would have been a more likely outcome of the CSE*nAch interaction.

Hypothesis 5a-b. The final objective was to provide evidence of nAch as a moderator of the CSE- engagement relationships. nAch is by definition a “disposition

that motivates a person to... [attain] success and excellence,” and it was therefore theorized that this variable would be related to the motivational state of engagement (Sagie, 1994, p. 51). The hypothesized moderator was predicted to enhance the CSE-engagement relationship; nAch was likened to the drive to succeed that, when combined with the advantages associated with CSE, would lead to especially high levels of engagement. Contrary to this reasoning, the results indicated that the interaction was not significant for either engagement domain, failing to support the last set of hypotheses. An exploratory analysis revealed that nAch was significantly correlated with both engagement domains, however, supporting the notion that these variables are related. Specifically, this finding demonstrated a connection between the general motivational trait of nAch to engagement in both broad and narrow domains.

One final possible reason why the results were not significant may be due to the difficulty in detecting interaction effects. Because interactions will usually account for just one to three percent of outcome variance, a large sample size is required to detect an effect (Champoux & Peters, 1987). According to Fairchild and MacKinnon (2009), a sample size between 500 and 1000 will be required to achieve a power of .80 in a moderated mediation model such as the one proposed in the present study. The sample size of the present study totaled 594, which fell within the range recommended by these authors. Thus, the failure to detect significant effects for many of the hypothesized relationships was not likely due to low statistical power.

Limitations & Directions for Future Research

A limitation of the present study was the use of self-report data for all predictor variables. Even if the model had been fully supported, causality cannot be inferred from such a design. However, questions concerning one's personality and motivation are arguably most accurately answered via self-report. Furthermore, this limitation would only apply to the predictors and not the outcome variables, as two objective measures of performance were collected from alternative sources external to the participants.

In addition to the altered setting and sample from previous studies examining CSE, other limitations associated with using student participants may help explain the lack of support for the hypothesized relationships. Undergraduate students who were purely extrinsically motivated by extra class credit may not have invested sufficient time or thought when taking the survey, potentially distorting true relationships between the constructs of interest. Future research involving these variables should be conducted in applied settings to address the drawbacks associated with the use of a student sample.

Issues related to the measures used in the study may have contributed to additional limitations. Firstly, the vocabulary of the survey items may have been above the reading level of some participants. For example, even though an attempt was made to update outdated words and phrases from the Ray Achievement Motivation Scale, a number of students left the question containing the word "cultivate" blank. One participant even put a question mark next to this word, while another circled it; neither responded to the item. Future studies involving the nAch variable might have better results if one of the many other measures of this construct is considered, or additional modifications of Ray's (1979) scale are made.

Secondly, the items in the CSE, nAch, and engagement measures all assess traits that are clearly desirable. Although it was proposed above that the participants may not have truly invested themselves in the survey, it is equally plausible that students may have exaggerated or understated their true thoughts and feelings in order to maintain appearances or their self-esteem. It is unlikely that many individuals would be willing to strongly agree with statements that admit laziness or doubts about personal competence, for example, even when assured of confidentiality. This “conscious attempt to present false information to create a favorable impression on others” is known as impression management (McFarland & Ryan, 2006, p. 980). Rosse, Stecher, Levin, and Miller (1998) proposed that participants may be most likely to fake responses on personality assessments when they have the opportunity and motivation to do so, when the items are transparent, and when they believe their responses cannot be verified. This effect may have been especially strong in the present study since students’ names and university identification numbers had to be obtained to match their surveys with test scores and GPAs. High means and low standard deviations on both engagement measures (domain engagement $M = 4.28$, $SD = .48$, general academic engagement $M = 4.44$, $SD = .42$) provide additional support for this explanation, at least in respect to the engagement construct. These statistics demonstrate that most participants answered similarly to the engagement measures and chose response options at the high end of the scales.

In a similar vein, responses to the engagement measures may have contributed to a lack of significant relationships. The first indication of atypical data in the present study was Cronbach alphas that were considerably lower than previous studies. The domain

engagement alpha for the present study was .79 and the general engagement alpha was .75, whereas in a previous study it was .91 (albeit with a sample of US soldiers, Britt, Adler, & Bartone, 2001). Moreover, this engagement scale has been found to be predictive of test performance in college students at the very same university in a previous study (Britt et al., in press), but was only predictive of GPA in the present study. Evidence such as this suggests that the measure did not “behave” in its usual manner, or possibly that an unknown characteristic of the sample was present. Thus, the relationships between engagement and the other constructs may have been artificially diminished in the present study, whereas they may have presented in another sample with more typical data.

Lastly, results of a correlational analysis between the two engagement measures indicated that the two were very highly correlated ($r = .71$). This finding could suggest that students were not able to effectively distinguish between the two dimensions of engagement; consequently, the measures may not have assessed the construct as reliably as in previous studies. This may have possibly been due to the abstract and highly subjective nature of the construct. For instance, one student who studied for two hours for a test may have perceived herself to be highly engaged, while another student who studied for 15 minutes also perceived himself to be highly engaged. Perhaps providing a definition of engagement or giving the students an example of high and low levels of engagement behavior would have helped them to differentiate between test-specific and academic engagement. The scale anchors and instructions could be altered in a future study to determine whether this has an effect on item responses.

Contributions of the Current Study

The model in the present study involved moderated mediation and included two interacting traits as predictors of distal performance outcomes. Specifically, the relationships put forth in the present study hypothesized an interaction between the CSE and nAch personality variables in the prediction of the motivational state of engagement. This state was hypothesized to mediate the relationships between the traits and two performance domains. Although the proposed moderated and mediated relationships failed to achieve statistical significance, portions of the model were in fact supported, particularly with respect to the broad academic domain.

In their commentary on the current state of personality research pertaining to organizations, Smith and Schneider (2004) noted that there are two main paradigms used to explain human behavior: trait theory and social-cognitive theory. The former, the authors state, seeks to describe the *stability* of behavior, while the latter seeks to explain the *variations* in behavior. Although these two theories may seem to be in opposition, Smith and Schneider (2004) point out that it is the combination of these approaches that may prove to be quite promising for the field of personality psychology. Coined *coherence* by Block in 1977, this integration is “the reliable prediction of how people respond to contextual differences” (Smith & Schneider, 2004, p. 396). The authors go on to emphasize the paucity of research that unites these views, which can actually be complementary to each other. The present study highlighted an interest in testing relationships between personality variables and performance when mediated by a motivational state in an academic setting. Thus, the present study attempted to contribute

to this underrepresented field of research by investigating relationships in both general and specific conditions. This effort to understand when these relationships are context-specific is an important addition to mediation research, despite the fact that the hypothesized mediated relationships in the present study did not reach statistical significance.

No single personality trait is a great predictor of performance, as previously noted. In addition, human dispositions do not exist in a vacuum; they are constantly interacting with each other and with the environment to generate subsequent behaviors. Smith and Schneider (2004) also call attention to the fact that “there remains very little research that hypothesizes or examines trait interactions in the prediction of behavior” (p. 400). The present study was an attempt to answer this call by addressing the need for testing interactions of traits. Although the results of the present study did not reveal the importance of traits interacting with one another to predict context-specific states, the endeavor was still important in that it demonstrated the feasibility of testing trait interactions. Furthermore, future researchers could build on this foundation of knowledge by addressing the limitations that the present study revealed, which could increase their chance of finding significant effects. For instance, most of the significant effects in the present study were in the broad domain. Thus, future researchers might deduce that relationships involving broadly measured constructs, such as engagement or performance, as opposed to a narrowly measured construct, in an academic setting might be more similar to these constructs as measured in a job setting.

It is important to remain undeterred by non-significant results in studies such as the present one. Rather, researchers should address the limitations of previous research and adjust their hypotheses on the basis of any relevant findings, continuing to pursue greater understanding of pertinent work-related variables.

APPENDICES

Appendix A

Relationships of Core Self-Evaluation Traits to Each Other

| | Self-Esteem | Locus of Control | Emotional Stability |
|-----------------------------------|--------------------|-------------------------|----------------------------|
| Self-Esteem | | | |
| Locus of Control | 0.52 | | |
| Emotional Stability | 0.64 | 0.40 | |
| Generalized Self- Efficacy | 0.85 | 0.56 | 0.62 |

(Bono & Judge, 2003, p. 7)

Appendix B

General Consent Form

Consent Form for Participation in a Research Study

Clemson University

Personality and Student Performance

Description of the research and your participation

You are invited to participate in a research study conducted by Dr. Thomas Britt and Christine Haugh. The purpose of this research is to better understand the relationships between personality and performance in college students. Your participation will involve completing a brief personality questionnaire and responding to other questions about yourself. The approximate amount of time required for your participation will be between 15 and 20 minutes.

Risks and discomforts

There are no known risks or discomforts associated with this research.

Potential benefits

There are no known benefits to you that would result from your participation in this research. However, you may be granted extra credit for the course at the discretion of your professor. Additionally, the information learned could provide a better understanding of the relationships between personality attributes and academic performance in college students. You may contact Christine Haugh at chaugh@clemson.edu to obtain a copy of the results once the study has been concluded, if desired.

Protection of confidentiality

We request your student ID so that we can match your survey responses to your GPA and test scores. This information will be used strictly for research purposes and will not be disclosed to anyone outside of the study. Your identity will not be revealed in any publication that might result from this study.

In rare cases, a research study will be evaluated by an oversight agency, such as the Clemson University Institutional Review Board or the federal Office for Human Research Protections, that would require that we share the information we collect from you. If this happens, the information would only be used to determine if we conducted this study properly and adequately protected your rights as a participant.

Voluntary participation

Your participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study.

Contact information

If you have any questions or concerns about this study or if any problems arise, please contact Dr. Thomas Britt at twbritt@clemson.edu. If you have any questions or concerns about your rights as a research participant, please contact the Clemson University Office of Research Compliance at (864) 656- 6460.

Consent

I have read this consent form and have been given the opportunity to ask questions. I give my consent to participate in this study.

Participant's signature: _____ Date: _____

A copy of this consent form should be given to you.

Appendix C

Consent for Release of Educational Data for Use in a Research Study

CLEMSON UNIVERSITY

Personality and Student Performance

I, _____, authorize Thomas Britt and Christine Haugh to obtain the following data about me for use in their research study entitled, "Personality and Student Performance":

- My grade point average from the beginning of Fall 2009
- My test score from a single upcoming psychology exam

These data will be secured by the investigators; no one else will have access to this information. NONE of this information will be published or released as identifying data.

Clemson ID number: _____

Date of initial enrollment at Clemson University: _____

(Month/Year)

Participant's Name: _____ (please print)

Participant's signature: _____ Date: ____ / ____ / ____

MM DD YY

Appendix D

Demographics

1. Gender (circle one): Male or Female

2. Age: _____

Note: If you are younger than 18, you are ineligible to participate in this survey.

3. Ethnicity (circle one):

a. African-American

b. American Indian

c. Asian-American

d. Hawaiian / Pacific Islander

e. Hispanic American / Origin

f. White / Caucasian

g. Other (please specify): _____

4. Year in college (circle one):

Note: If you are younger than 18, you are ineligible to participate in this study.

a. Freshman

b. Sophomore

c. Junior

d. Senior

e. Graduate student

Appendix E

Core Self-Evaluations Scale (CSES)

Instructions: Using the response scale below, indicate your agreement or disagreement with each statement by placing the appropriate number on the line preceding that statement.

| 1 | 2 | 3 | 4 | 5 |
|----------------------|----------|---------|-------|-------------------|
| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |

1. ____ I am confident I get the success I deserve in life.
2. ____ Sometimes I feel depressed. (*r*)
3. ____ When I try, I generally succeed.
4. ____ Sometimes when I fail I feel worthless. (*r*)
5. ____ I complete tasks successfully.
6. ____ Sometimes, I do not feel in control of my work. (*r*)
7. ____ Overall, I am satisfied with myself.
8. ____ I am filled with doubts about my competence. (*r*)
9. ____ I determine what will happen in my life.
10. ____ I do not feel in control of my success in my career. (*r*)
11. ____ I am capable of coping with most of my problems.
12. ____ There are times when things look pretty bleak and hopeless to me. (*r*)

r = reverse scored

Appendix F

Ray Achievement Motivation Scale

Instructions: Using the response scale below, indicate your agreement or disagreement with each statement by placing the appropriate number on the line preceding that statement.

| 1 | 2 | 3 | 4 | 5 |
|-------------------|----------|---------|-------|----------------|
| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |

1. ____ Being comfortable is more important to me than getting ahead. (*r*)
2. ____ I am satisfied to be no better than most other people in school. (*r*)
3. ____ I like to make improvements to the way the organizations I belong to function.
4. ____ I take trouble to cultivate people who may be useful to me in college or my career.
5. ____ I get restless and annoyed when I feel I am wasting time.
6. ____ I have always worked hard in order to be among the best in my own major or class.
7. ____ I would prefer to work with an agreeable but incompetent partner rather than with a difficult but highly competent one. (*r*)
8. ____ I tend to plan ahead for college or my career.
9. ____ Being successful in life is important to me.
10. ____ I am an ambitious person.
11. ____ I am inclined to benefit from the successes of others rather than do the work of making myself a success. (*r*)
12. ____ I would describe myself as being lazy. (*r*)
13. ____ Days often go by without me having done a thing. (*r*)
14. ____ I am inclined to take life as it comes without much planning. (*r*)

r = reverse scored

Appendix G

Academic Engagement Scale

Instructions: The following statements refer to thoughts about your **COLLEGE PERFORMANCE IN GENERAL**. Using the response scale below, indicate your agreement or disagreement with each statement by placing the appropriate number on the line preceding that statement.

| 1 | 2 | 3 | 4 | 5 |
|-------------------|----------|---------|-------|----------------|
| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |

1. ____ I feel personal responsibility for my academic performance.
2. ____ I am committed to performing well as a college student.
3. ____ How well I do in college matters a great deal to me.
4. ____ How well I do in college influences how I feel.
5. ____ I invest a large part of myself into my academic performance.

Appendix H

Domain- Specific Engagement Scale

Instructions: The following statements refer *specifically* to thoughts about your **UPCOMING TEST**. Using the response scale below, indicate your agreement or disagreement with each statement by placing the appropriate number on the line preceding that statement.

| | | | | |
|----------------------|----------|---------|-------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |

1. ____ I feel personal responsibility for my upcoming psychology test performance.
2. ____ I am committed to performing well on the upcoming psychology test.
3. ____ How well I do on the upcoming psychology test matters a great deal to me.
4. ____ How well I do on the upcoming psychology test influences how I feel.
5. ____ I invest a large part of myself into my test performance.

Appendix I

Tables and Figures

Table 1. Means, Standard Deviations, Intercorrelations, and Reliability Estimates Among Variables

| | Variable | <i>M</i> | <i>SD</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---------------------------|----------|-----------|-------------------|---------|--------|-------------------|--------|--------|--------|
| 1 | <i>Gender</i> | 1.53 | 0.50 | | | | | | | |
| 2 | <i>Age</i> | 18.71 | 1.41 | 0.07 [†] | | | | | | |
| 3 | <i>CSE</i> | 3.75 | 0.50 | -0.17** | -0.05 | (0.82) | | | | |
| 4 | <i>nAch</i> | 3.69 | 0.45 | 0.19** | 0.02 | 0.23** | (0.76) | | | |
| 5 | <i>Domain Engagement</i> | 4.28 | 0.48 | 0.12** | -0.04 | 0.05 | 0.42** | (0.79) | | |
| 6 | <i>General Engagement</i> | 4.44 | 0.42 | 0.06 | -0.12** | 0.16** | 0.53** | 0.71** | (0.75) | |
| 7 | <i>Test Score</i> | 81.36 | 12.45 | 0.08 [†] | 0.01 | -0.01 | 0.08 [†] | 0.02 | 0.03 | |
| 8 | <i>GPA</i> | 3.05 | 0.58 | 0.20* | -0.04 | -0.07 | 0.15 [†] | -0.06 | 0.20* | 0.38** |

Note: Internal consistency reliability estimates are plotted on the diagonal

* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed). [†] $p < .05$ (1-tailed).

Gender was coded as 1 = male and 2 = female; CSE = Core Self-Evaluations, nAch = Need for Achievement, GPA = Grade Point Average.

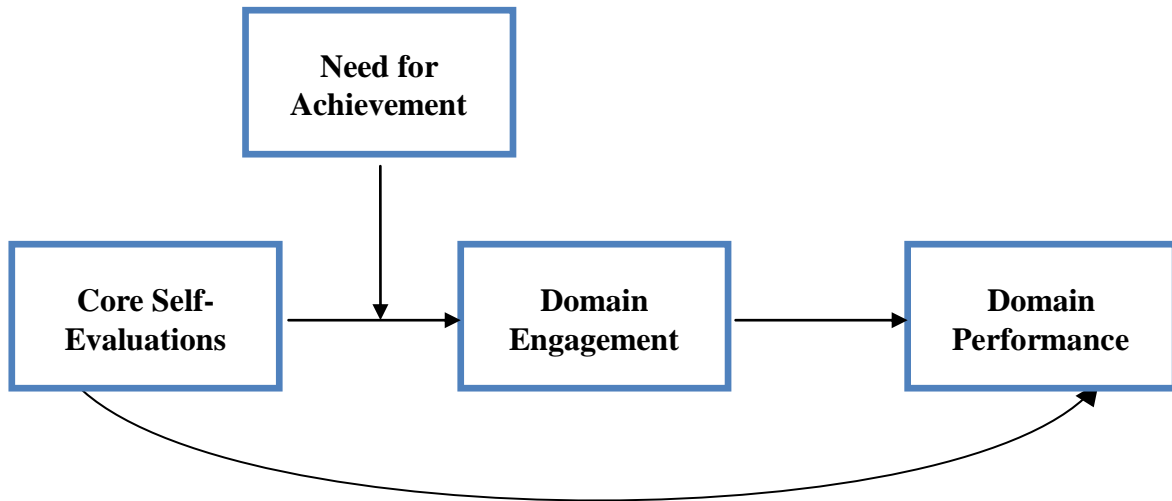
Table 2. Domain Engagement as a Function of CSE and nAch

| Predictors | β | Stand. Error | t | p | ΔR^2 |
|---------------------------------------|---------|--------------|-------|-----|--------------|
| Model 1: Main Effects | | | | | .18 |
| <i>CSE</i> | -0.04 | .04 | -1.15 | .25 | |
| <i>nAch</i> | .43 | .04 | 11.04 | .00 | |
| Model 2: Main Effects and Interaction | | | | | .00 |
| <i>CSE</i> | -.04 | .04 | 1.09 | .28 | |
| <i>nAch</i> | .43 | .04 | 10.99 | .00 | |
| <i>CSE*nAch</i> | .02 | .07 | .47 | .64 | |

Table 3. General Academic Engagement as a Function of CSE and nAch

| Predictors | β | Stand. Error | t | p | ΔR^2 |
|---------------------------------------|---------|--------------|-------|-----|--------------|
| Model 1: Main Effects | | | | | .29 |
| <i>CSE</i> | .04 | .03 | 1.08 | .28 | |
| <i>nAch</i> | .52 | .03 | 14.42 | .00 | |
| Model 2: Main Effects and Interaction | | | | | .00 |
| <i>CSE</i> | .04 | .03 | 1.03 | .30 | |
| <i>nAch</i> | .52 | .03 | 14.21 | .00 | |
| <i>CSE*nAch</i> | -.01 | .06 | -.35 | .73 | |

Figure 1. The Interaction of Core Self-Evaluations and Need for Achievement in Predicting Engagement as an Antecedent of Performance.



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FOOTNOTES

¹ The PsychInfo search was conducted through EbscoHost on April 4, 2009 and produced over 5,000 articles referencing the construct.

² A series of two-way between-groups ANOVAs were conducted to investigate possible interactions. Because data were collected from three separate professors teaching different classes of varying difficulty, these analyses were conducted to see whether there were differences in test scores or GPAs in the three classes. Test grade was examined as the dependent variable in the first univariate ANOVA. The results suggested that the mean test score from the Psychology Statistics class ($M = 85.22$) was significantly higher than the mean test score from the Introductory Psychology course ($M = 80.90, p = .015$).

GPA was examined as the dependent variable in the second univariate ANOVA. The results of this analysis indicated that the mean GPA from the Personality Psychology course ($M = 3.33$) was higher than that of the Introductory Psychology course ($M = 2.90, p = .001$). Significant differences between classes were also found with respect to CSE. The mean CSE score from the Personality Psychology class ($M = 3.48$) was significantly lower than that of the Introductory Psychology class ($M = 3.77, p = .001$) as well as the Psychology Statistics class ($M = 3.74, p = .017$). There were no significant differences between classes in nAch or either engagement domain.

Despite the differences between classes in the mean scores of any of the variables, however, the relationships between the variables of interest were not strongly divergent between classes. (The sample size in the Personality Psychology and Psychology Statistics courses was too small to investigate interaction hypotheses separately from the

Introductory Psychology class.) Thus, any significant relationships, or lack thereof, were not attributed to the class in which the participants were enrolled.

³ Because there are dozens of tests to assess the need for achievement, it became necessary to narrow them down to locate a measure that was short, reliable, valid, and easy to administer. Many tests were eliminated as options for failure to meet these requirements or for other flaws such as low face validity, requiring close supervision or being intended for young children. The Thematic Apperception Test (TAT), which was often used and advocated for by McClelland (e.g., McClelland, 1972; McClelland, 1985) would have been unwieldy for the present study as it requires participants to write stories to explain a series of pictures, which must then be coded by a researcher. Additionally, the TAT has been criticized for low test-retest and internal reliability as well as insufficient convergent validity (Spangler, 1992).

⁴ Although Hostelling's (1940) *t*-test is still traditionally conducted to compare correlated correlation coefficients, this method has been repeatedly demonstrated to be inappropriate and flawed (Meng, Rosenthal, & Rubin, 1992; Steiger, 1980).