Toward a resilience model of student well-being: A self-determination approach to thriving and burnout among college students

by

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ABSTRACT

The present study investigated the experience of thriving and burnout among college students with regard to their within-person resilience resources using a Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000) framework. SDT has proposed and documented that satisfaction of the basic needs for autonomy, competence, and relatedness facilitates indicators of well-being in a variety of contexts. However, few studies have explored the ability of the academically grounded basic psychological needs to mediate relations between students’ within-person resilience variables (i.e., dispositional optimism and cognitive reappraisal) and indicators of student well-being (i.e., student thriving and student burnout). Structural equation modeling (SEM) was used to examine a model positing that each basic psychological need would fully mediate these relations among 658 current students at a large, upper-midwestern R1 university. The measurement and structural models were a good fit to the data. Dispositional optimism and cognitive reappraisal each had significant positive relations with all three basic needs. Perceived academic competence and perceived campus relatedness has significant positive relations with student thriving while only perceived academic competence significantly related to student burnout. Academic volitional autonomy did not significantly relate to either student well-being indicator. Perceived academic competence fully mediated relations between both resilience variables and both student well-being outcomes. Perceived campus relatedness also fully mediated relations between both within-person resilience variables and student thriving. Conclusions, implications, limitations, and future directions for investigators are discussed.
CHAPTER 1. INTRODUCTION

A vigorous and effective workforce is essential to economic prosperity at both the individual and national level and stands as the primary goal of the educational system in the United States. Such a workforce is comprised of individuals who regularly experience thriving in their various environments (Spreitzer, Sutcliffe, Dutton, Sonenshein, & Grant, 2005) while avoiding feelings of work burnout (Maslach, Schaufli, & Leiter, 2001). While the usefulness of thriving in a work setting is well documented in the literature (e.g., Brown, Arnold, Fletcher, & Standage, 2017), the application of thriving to the post-secondary domain lacks a parsimonious, theoretical base. Conversely, the construct of burnout has been extended from the work literature and examined among college students (e.g., Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). However, notably absent from the literature is a theoretical frame for explaining the relationship between within-person factors that contribute to experiences of thriving and burnout among post-secondary students. The present investigation represents an initial effort to examine a model of thriving and burnout among college students grounded in self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000) that uses within-individual factors as the primary predictors.

In the work literature, thriving has been defined as a psychological state centered on the joint experience of vitality and learning (Spreitzer et al., 2005). Vitality refers to feeling energized and alive while a sense of learning refers to the feeling that one is continually improving and getting better at the task at hand (Porath, Spreitzer, Gibson, & Garnett, 2012). Conceptualized as a marker of forward progress that enables one to monitor one’s own self-improvement (Spreitzer, Sutcliffe, Dutton, Sonenshein, & Grant, 2005), thriving represents an
important outcome that can enable one to identify other psychological constructs that foster
growth and contribute to well-being.

In the work literature, this conceptualization of thriving has been associated with positive
outcomes. For example, relevant to both workplace productivity and worker well-being, thriving
has been shown to be positively related to: (a) job performance among employees at an
engineering firm (Gerbasi, Porath, Parker, Spreitzer, & Cross, 2015), (b) job satisfaction in
individuals across work environments (Marchiondo, Cortina, & Kabat-Farr, 2018), and (c)
 improved health among civil service employees in Indonesia (Walumbwa, Muchiri, Misati, Wu,
& Meiliani, 2018). Despite the numerous desirable consequences associated with thriving
defined as the joint experience of vitality and learning, this conceptualization has not been
explored in college students.

Although an alternative conceptualization of thriving among college students has been
written about, the empirical work surrounding this literature has resulted in very few peer-
reviewed publications (i.e., Schreiner, 2010a, 2010b, 2010c) and even those present no empirical
findings. Thus for the purposes of this investigation, the construct of thriving empirically
anchored in the work literature will be used. As such, a primary objective of the current study
was to explore determinants of thriving in college students using Spreitzer et al.’s (2005)
conceptualization of human thriving.

Conversely, individuals in high-demand environments such as college may also
experience burnout, a syndrome brought on by chronic stress that represents a task-related
decrease in well-being (Maslach & Jackson, 1981) and an inherent lack of growth. Burnout
among students has been conceptualized as involving three dimensions of dysfunction: 1)
emotional exhaustion defined as emotional depletion and loss of energy due to study demands; 2)
having a cynical, detached attitude toward one’s studies; and 3) reduced feelings of personal accomplishment and self-efficacy as a student along with feelings of personal inadequacy within one’s role as a student (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2001). Reduced personal accomplishment also includes reductions in productivity and personal coping skills (Maslach & Leiter, 2016).

In the present study, student burnout was conceptualized using only the emotional exhaustion and cynicism dimensions. This decision was made in light of the consistent finding that correlations between self-inefficacy and the other two burnout factors are lower than correlations between emotional exhaustion and cynicism (e.g., Poghosyan, Aiken, & Sloane, 2009; Schaufeli et al., 2002; Zhang et al., 2007). Schaufeli and Taris (2005) proposed self-ineffacy may not be part of the burnout syndrome but instead a consequence of the burnout experience. Additionally, the theory employed in the current study (i.e., self-determination theory) posited a conceptually similar construct, namely perceived academic competence, as a mediating variable rather than an outcome. Because this variable captures the role of efficacy elsewhere in the current model, students’ self-ineffacy was not included in the measure of student burnout.

Student burnout, defined as either emotional exhaustion, cynicism, or both together, has been demonstrated to be associated with negative student outcomes. For example, student experiences of emotional exhaustion and cynicism have been shown to negatively predict other-rated performance among undergraduate students (Nowack & Hanson, 1983) and exam performance (Schaufeli, et al., 2002). Further, student experiences of emotional exhaustion have predicted undergraduates’ ratings of their own perceived performance (Garden, 1991). Specifically, students experiencing a deficit in well-being have been shown to experience worse
academic performance along with higher levels of depression and anxiety (Cotton, Dollard, & De Jonge, 2002).

Emotional exhaustion and cynicism experienced together or in isolation have also been associated with a variety of physical, psychological, and workplace consequences. For example, cross-sectional investigations into the physical consequences of work burnout have shown emotional exhaustion and cynicism to be significantly related to obesity and sedentarism (Ahola, Pulkki-Raback, Kouvonon, Rossi, Aromaa, & Lonngvist, 2012), as well as pain (Aghilinejad, Zargham Sadeghi, Sarebanha, & Bahrami-Ahmadi, 2014). The emotional exhaustion and cynicism components of burnout have also been shown to significantly predict insomnia (Armon, Shirom, Shapira, & Melamed, 2008) and depression (Armon, Melamed, Toker, Berliner, & Shapira, 2014). Finally, from an occupational perspective, the joint experience of emotional exhaustion and cynicism has been associated with undesirable work outcomes such as job dissatisfaction (Figueiredo-Ferraz, Grau-Alberola, Gil-Monte, & Garcia-Juesas, 2012) and absenteeism (Hallsten, Voss, Stark, & Josephson, 2011).

Given the notable implications for thriving and burnout, it becomes imperative to identify the antecedents to these constructs so that one can develop strategies for maximizing thriving and minimizing burnout. In the current study, SDT (Ryan & Deci, 2000; Deci & Ryan, 1985) was used to provide a conceptual framework that may explain the relationships between two within-person variables and two important student outcomes, namely student thriving and student burnout. In doing so, the present investigation aimed to explore a resilience-based model of student thriving and student burnout relevant for students that is conceptually grounded in an empirically validated theory of optimal psychological functioning.
Dispositional Optimism

Optimism as an individual difference is characterized most often in the literature as a “generalized expectation that influences any and all psychological processes in which learning is involved” (Peterson, 2000; p. 47). A primary vein of research stemming from this understanding of optimism has been the portrayal of optimism as dispositional. Dispositional optimism has been defined as a global expectation that good things will be plentiful in the future and bad things will occur infrequently (Sheier & Carver, 1992). Under this perspective, human behavior can be couched in terms of the pursuit of desirable values such that individuals identify and adopt goals and subsequently regulate actions to pursue these goals. From this perspective, dispositional optimism represents the foundation of a self-regulatory model (Carver & Scheier, 1981). Carver and Scheier (1981) argue that individuals hold an optimistic perspective when they believe that goals can be achieved despite encountering adversity or impediments to their goals. As such, optimism enables such individuals to persist in their pursuit of goals despite perceived obstacles.

In the current study, dispositional optimism was used as a positive predictor of student thriving and a negative predictor of student burnout. Optimism has been cited in the literature as being an important prerequisite for thriving. While the relationship between optimism and thriving among students has not been heavily investigated, Schreiner (2010a) has included “having a positive outlook on life, an optimistic way of viewing the world, and the future” as one of five factors that composes her definition of student thriving. Furthermore, Schreiner (2010a) found an optimistic outlook to be positively correlated with engaged learning, the subconstruct of her definition of thriving most aligned with the definition of thriving utilized by the current investigation. Although this conceptualization of thriving deviates from the definition forwarded
in the current discussion, this perspective suggests a relationship between optimism and thriving among students.

Vocationally, dispositional optimism has been included as an integral element of psychological capital, a variable that has been consistently demonstrated to predict thriving at work (Kleine, Rudolph, & Zacher, 2019). Niessen, Sonnentag, and Sach (2012) determined optimism to be a key ingredient for enhancing thriving at work. Additionally, qualitative research has found a positive expectation for future outcomes to be a recurring theme among high achievers (Sarkar & Fletcher, 2014) as well as teachers (Sumison, 2004) who report the experience of thriving at work.

Dispositional optimism has also been highlighted as a preventative factor in studies of burnout. An examination of Spanish undergraduate students revealed optimism to negatively predict emotional exhaustion, a core component of academic burnout (Vizoso, Arias-Gundín, & Rodriguez, 2019). An additional study of university students in Spain also found dispositional optimism to negatively predict emotional exhaustion (Vizoso-Gómez & Arias-Gundín, 2018). Among working students, dispositional optimism was found to relate negatively with emotional exhaustion and cynicism. These results indicate dispositional optimism may act as a buffer against perceptions of burnout in student populations (Chang, Rand, & Strunk, 2000). Such findings among students lend support to the utility of dispositional optimism as a protective factor against burnout among students in both academic and work settings.

**Cognitive Reappraisal**

Along with dispositional optimism, emotion regulation strategies have also been shown to play an important role in maximizing indices of positive human functioning such as thriving. One specific regulation strategy that has garnered attention in the literature has been cognitive
reappraisal (Gross, 1998a). In his model of emotion regulation, Gross (1998a, 2008) defines cognitive reappraisal as a cognitive-oriented strategy that alters the effect of an emotion by changing the way a situation is perceived or evaluated. Cognitive reappraisal is an antecedent-focused strategy that aims to reduce the impact of a painful emotion or enhance the effect of a positive emotion prior to or during the beginning of an emotional episode (Katana, Röcke, Spain, & Allemand, 2019). Similar to dispositional optimism, cognitive reappraisal has been characterized as an emotional resilience variable (Gross, 1998a) that may allow individuals to persist in their tasks despite encountering adversity or setbacks which increases the likelihood of experiencing growth and thereby contributing to more thriving and less burnout.

While the relationship between cognitive reappraisal and thriving has not been directly assessed, cognitive reappraisal has been shown to relate positively with other indices of optimal functioning (i.e., life satisfaction and positive affectivity; Hu, Zhang, Wang, Mistry, Ran, & Wang, 2014). Similarly, engaging in cognitive reappraisal has been found to predict enhanced functioning amongst students such that individuals regularly using cognitive reappraisal as an emotion-regulation strategy experience higher levels of life vitality, health concern, commitment to altruism, self-value, friendship, and personal development (Wang, Li, Hu, Dong, & Tao, 2017). These findings provide further evidence of cognitive reappraisal ability as an adaptive approach to adversity that increases the likelihood of thriving. Relatedly, cognitive reappraisal has been associated with improved long-term learning outcomes among college students such as final exam scores at the end of the semester (Cavanagh, Lang, Birk, Fulwiler, & Urry, 2019) as well as greater perceptions of thriving work conceptualized as greater perceptions of efficacy and commitment (Quinones, Rodriguez-Carvajal, & Griffiths, 2017).
Furthermore, cognitive reappraisal has also been identified as relating negatively with burnout-related constructs among college students. Specifically, cognitive reappraisal was found to mediate the relationship between boredom and student burnout, indicating that cognitively reframing a situation may allow for continued growth and the avoidance of burnout (Zhou, Li, Jin, & Jin, 2016). Cognitive reappraisal has also been linked with lower levels of depression among students during the transition into college (Kneeland & Dovidio, 2019). In a sample of workers, cognitive reappraisal was also shown to mediate the relationship between occupational stress and job burnout, indicating cognitive reappraisal ability may be an effective emotion regulation strategy for reducing work burnout (Nie, Gan, & Cui, 2017). Furthermore, Wang and colleagues (2017) also found cognitive reappraisal to moderate the relationship between academic stress and negative academic emotions related to student burnout (i.e., boredom, hopelessness, disappointment, hatred, anxiety, shame, anger) such that academic stress was not significantly associated with student burnout among individuals high in cognitive reappraisal.

While dispositional optimism and cognitive reappraisal have been shown to relate positively with thriving and negatively with burnout, an empirical-based conceptual frame for understanding these relationships seems to be lacking. Positing a model explaining the means through which optimism and cognitive reappraisal result in student thriving while minimizing student burnout would be useful for clinicians working with students to improve both their academic performance and overall well-being. Such an understanding could also inform academic support programs designed to assist students transitioning into high education or those who are underperforming academically. Identifying a conceptual frame to describe the functionality of dispositional optimism and cognitive reappraisal may also inform how these constructs might be best cultivated in students in order to maximize thriving and burnout, two
indices of well-being particularly relevant for students. As such, SDT represents a potential foundation that has garnered consistent validity in the literature and could prove useful in explaining this relationship as it is designed to elucidate the predictive factors contributing the indices of well-being.

**Self-Determination Theory**

SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) is a theory of human motivation that conceptualizes motivation as existing on a continuum from external motivation to internalized motivation. External motivation involves actions driven by anticipated outcomes aligned with socially accepted values while internalized motivation centers on actions driven by one’s innate curiosity and desire for growth and behavioral mastery. Under SDT, extrinsically motivated action can gradually transition to internalized motivation as the social values that dictate extrinsically motivated behavior become integrated and internalized into one’s personal values (Deci & Ryan, 1985). The social values become internalized through the fulfillment of three basic psychological needs: volitional autonomy (the need to hold ownership over one’s choices and actions), perceived competence (the need to feel effective in managing one’s tasks), and relatedness (the need to feel a sense of belonging and connection with others). A wide array of literature suggests fulfillment of these needs results in the internalized pursuit of personal growth which results in a heightened state of well-being (e.g., Chen et al., 2015; Ryan, Huta, & Deci, 2006).

Because thriving and burnout among students represent their ability to function within their environment, the current study utilized these constructs as indicators of well-being. Using thriving as an indicator of well-being, Spreitzer and Porath (2014) have posited a model of human thriving at work that uses SDT to conceptualize the relationship between the work
environment and thriving at work. This model centers on the SDT-based notion that as behaviors become more intrinsically motivated, they become less effortful and energy depleting. Specifically, satisfaction of the basic psychological needs results in increased energy available to the self, resulting in an increased sense of enthusiasm, aliveness, and positive energy (Ryan & Deci, 2008). As such, SDT posits that individuals experience increased vitality through satisfaction of the needs for volitional autonomy, perceived competence, and perceived relatedness. Ryan and Deci (2000) argue that these needs serve as psychological nutriments for individuals’ growth and development.

**SDT’s Basic Psychological Needs and Thriving/Burnout**

While the relationships between the basic psychological needs and thriving and burnout among college students have not been directly assessed, the linkages between students’ volitional autonomy, perceived competence, and perceived relatedness within their academic environment and student well-being indicators have been documented throughout the literature. For example, volitional autonomy has been found to positively predict indicators of well-being among college students, including vitality and positive mood (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Identified as crucial to the attainment of well-being, volitional autonomy has been identified as significantly and positively relating to both components of thriving in vocational settings (Spreitzer & Porath, 2014).

Additionally, perceived competence has also been identified as a significant predictor of well-being among students, as indicated by positive affect, negative affect, and vitality (Reis, et al., 2000). Further, perceived academic competence among colleges students was identified as a predictive factor of general life satisfaction and self-esteem, two indicators of student well-being, in American and German samples (Levesque, Zuehlke, Stanek, & Ryan, 2004). Perceived
competence has also been shown to predict both vitality and learning in work samples (Spreitzer & Porath, 2014).

Further, relatedness among peers has also been shown to significantly, positively predict positive mood and vitality in college students, two indicators of college student well-being (Reis, et al., 2000). Similarly, a sense of belonging within a university positively predicted student well-being, as indicated by symptoms of anxiety and depression, as well as academic motivation, and intentions to dropout (Suhlmann, Sassenberg, Nagengast, & Trautwein, 2018). Relatedness amongst colleagues and a sense of belongingness within one’s work environment also served to predict vitality and learning, both subconstructs of thriving (Spreitzer & Porath, 2014). Additionally, they found the three needs to account for 54% of the variance in the vitality component of thriving. Spreitzer and Porath (2014) considered their findings to demonstrate the utility of SDT’s basic psychological needs in predicting both the affective and cognitive aspects of thriving in among their samples of workers.

Similarly, the basic psychological needs have been shown to protect against burnout. In a sample of Taiwanese students, volitional autonomy, perceived competence, and relatedness were all significant predictors of the coping strategies that were negatively associated with academic burnout (Shih, 2015a). In a work setting, satisfaction of the basic psychological needs was observed to negatively related with emotional exhaustion in a heterogenous sample of 745 employees (Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008).

**SDT Basic Psychological Needs and Dispositional Optimism/Cognitive Reappraisal**

While the utility of self-determination theory in conceptualizing well-being has been well-documented, much of this literature has focused on the relationship between environmental variables and well-being (Deci & Ryan, 1985). Such studies have examined how the demands or
resources of a given environment have related to well-being through satisfaction or thwarting of the basic psychological needs (Vansteenkiste & Ryan, 2013). Conversely, little research has been done to investigate how within-person differences may explain well-being as a function of the basic psychological needs. It may be that high dispositional optimism and cognitive reappraisal may render one’s needs for autonomy, competence, and relatedness more able to be met than individuals lower in these qualities. More specifically, a high amount of dispositional optimism and cognitive reappraisal ability may reduce the likelihood that one experiences negative emotional states which inhibit the experience of volitional autonomy, perceived competence, and relatedness. As such, dispositional optimism and cognitive reappraisal may increase the likelihood of basic psychological need satisfaction which enhances psychological well-being (Ionecu, 2017). This assertion has garnered some support in the literature as both optimism and cognitive reappraisal have been found to relate significantly to the three basic psychological needs and needs-related constructs. Specifically, optimism emerged as a strength that significantly predicted satisfaction of autonomy, competence, and relatedness among Croatian university students (Brdr & Kashdan, 2009). Similar work done with non-student adults again showed that optimism was significantly and positively related to satisfaction of volitional autonomy, competence, and relatedness needs (Ionescu & Iacob, 2019; Ionescu, 2017). The use of cognitive reappraisal as an emotion regulation technique has also been shown to relate positively to the experience of volitional autonomy (Fishman & Husman, 2017). Further, cognitive reappraisal has also been associated with greater tendency to accept others positively which could result in greater feelings of relatedness with others (Xia, Gao, Wang, & Hollon, 2014). Taken together, such findings indicated that optimism and cognitive reappraisal may play
an important role in rendering one’s basic psychological needs for volitional autonomy, perceived competence, and relatedness more easily met.

**Purpose of Study**

The aims of the current study were threefold. First, this investigation intended to address the absence of a theoretical framework for thriving and burnout amongst students by conceptually grounding the relationships between dispositional optimism and cognitive reappraisal and thriving and burnout in an empirically sound frame using SDT. Second, the present investigation examined the utility of SDT’s basic psychological needs within a college context in fully mediating the relationships between two within-person variables and two indices of student well-being as shown in Figure 1. Such a model may provide evidence for the utility of SDT in conceptualizing relationships between within-person variables and indicators of student well-being, expanding the existing literature citing SDT as a useful frame for relationships between the environment and well-being. Finally, the current study sought to establish a parsimonious model of student thriving that is compatible with models of thriving at work. The measures used to operationalize each construct in the current model are presented in Table 1 for clarity. With the aforementioned goals in mind and in alignment with current literature, the following hypotheses were proposed and listed in Table 2:

**Hypothesis 1.** The model displayed in Figure 1 posited the basic psychological needs as fully mediating the relationships between the within-person resilience variables (dispositional optimism and cognitive reappraisal) and the student well-being indicators (student thriving and student burnout) will be a good fit to the data.
**Hypothesis 2.** Dispositional optimism and cognitive reappraisal will be significantly positively related to academic volitional autonomy, perceived academic competence, and perceived academic relatedness (paths 1-6).

**Hypothesis 3.** Academic volitional autonomy, perceived academic competence, and perceived academic relatedness will be significantly positively related to student thriving and negatively related to student burnout (paths 7-12).

**Hypothesis 4.** Academic volitional autonomy, perceived academic competence, and perceived academic relatedness will fully mediate the relationships between the predictors, dispositional optimism and cognitive reappraisal, and the student well-being indicators, thriving and burnout.

**Hypothesis 5.** The alternative model positing the partial mediation relationship displayed in Figure 2 will not be a significantly better fit to the data than the hypothesized full mediation model presented in Figure 1. Direct relations between the within-person resilience variables (dispositional optimism and perceived competence) and indicators of student well-being (e.g., student thriving and student burnout) have been widely documented in the extant literature. As such, the model presented in Figure 2 represents a plausible, partial-mediation alternative to the full-mediation model shown in Figure 1 using the basic psychological needs as complete mediators.
CHAPTER 2. LITERATURE REVIEW

This chapter will provide a review of the relevant literature describing the variables forwarded in Chapter 1 while offering the empirical basis for the relationships between these constructs as portrayed in Figure 1. First, I will present thriving and burnout as two important indicators of student well-being while describing the various operationalizations of these variables. Second, I will offer two within-person resilience variables, namely dispositional optimism and cognitive reappraisal, and provide evidence for their ability to foster thriving and reduce burnout in college students. Third, I will present self-determination theory (SDT) and describe it as a way of conceptualizing the relationship between the within-person resilience factors and the two indicators of student well-being. Specifically, I will describe the evidence suggesting the basic psychological needs posited by SDT directly relate to student thriving and burnout while mediating the relationship between these variables and dispositional optimism as well as cognitive reappraisal. This chapter will conclude with a section that emphasizes the utility of the current study in adding to the current body of literature and outlines how these findings may contribute to the enhancement of the post-secondary educational experience.

Literature for the current review was gathered using ERIC and PsycINFO online databases. Searches were limited to peer-reviewed empirical articles but did not exclude studies based on publication date. Statistical significance of bivariate relationships between variables was evaluated at the $p < .05$ level unless otherwise stipulated by the evaluated study. Further, effect sizes for relations among variables were evaluated using Cohen’s (1992) magnitude specifications (e.g., small effect: $r = .10-.29$; medium effect: $r = .30-.49$; large effect: $r = .50$ and above). Additionally, model fit characteristic for structural equation and path models were evaluated in alignment with Hu and Bentler’s (1999) Goodness-of-fit criteria: comparative fit
index (CFI) of .95 or greater, a root-mean-square error of approximation (RMSEA) of .06 or less, and a standardized root-mean-square residual (SRMR) of .08 or less. All available significance levels, effect sizes, and model fit statistics relevant to the current discussion were reported in the sections to follow.

**Student Thriving**

The term “thriving” has been present in many literatures and taken on a variety of definitions with little consensus between them (Sprietzer & Porath, 2014). In the earliest conceptualizations of the term, “failure to thrive” was used as a medical diagnosis for referring to infants and aging adults as indicated by underdevelopment and a lack of physical growth or the presence of physical atrophy (Bakwin, 1949; Holt, 1897). As the construct transitioned from medical practice into psychology, thriving was discussed in reference to psychological growth and improvement. The evolution of the term thriving in the field of psychology stems from the early work of Maslow (1943) and Rogers (1961) who each posited that humans have an innate drive to self-improve and maximize their full potential by moving toward a state of enhanced functioning. Maslow (1943) described this drive as the need to “self-actualize,” or to become everything that one is specifically capable of becoming. He noted that self-actualization is the final of five basic needs organisms seek to satisfy hierarchically. Relatedly, Rogers (1961) proposed humans have a single, basic primary drive to “actualize, maintain, and enhance the experiencing organism,” arguing that individuals seek to become their ideal self, an improved state of being one would like to embody.

Relying on the premise that humans seek to self-improve, thriving has been used to describe the experience of positive growth that exceeds mere survival (Saakvitine, Tennen, & Affleck, 1998). Rather, individuals deemed to be thriving have experienced self-change that
follows an upward trajectory or enhancement of the self (Hall et al., 2009; Thomas & Hall, 2008). Thriving understood from this perspective has garnered significant attention in the trauma and recovery literature. Specifically, thriving in this context has been described as positive growth that has originated in the struggle with trauma or some disruptive life event (Calhoun & Tedeschi, 1998; O’Leary & Ickovics, 1995). Carver (1998) described thriving as a “better-off-afterward experience” in which one’s response to an encounter with adversity involves an improvement in one’s functioning which may manifest as gains in skill, knowledge, confidence, or a sense of security in personal relationships. Similarly, Park (1998) referred to thriving as “a higher level of functioning in some life domain following a stressful encounter” (p. 269).

In addition to thriving as a response to trauma, the definition of thriving has varied and are most often specific to the narrow context to which thriving has been examined. For example, Campa, Bradshaw, Eckenrode, and Zielinski (2008) defined thriving among delinquent adolescents as dependent on employment status, civic engagement, and high school completion. In their study of low-income women who had recently given birth, Walker and Sterling (2007) conceptualized thriving as involving the absence of psychosocial distress, the presence of health practices, healthy body weight, and body image satisfaction. Although such definitions emphasize the enhanced functioning component of thriving, they are not fully applicable to the subjective experience of thriving generalizable to other settings and populations such as college students.

Other efforts to describe thriving have taken a more experiential approach with less emphasis on context and more focus on maximizing one’s potential. Bundick, Yeager, King, and Damon (2010) described thriving as an interaction between the individual and their environment that occurs over time and results in the enhancement of both the individual’s personal attributes
as well as the system present in the given environment. Sarkar and Fletcher (2014) reiterated the view of thriving as person-centered when they defined the construct as a “sustained high level of functioning and performance” that does not necessarily result from a traumatic event (p. 891). Expounding on Deiner and colleagues’ (1999) subjective well-being work, Su, Tay, and Deiner (2014) described thriving as positive functioning that occurs simultaneously across one’s mental, physical, and social domains.

Across contexts and definitions, thriving has been conceptualized both as an experience to which one may be predisposed and as experience cultivated by environmental resources or experiences. For example, O’Leary (1998) posited that one’s individual (e.g., personality characteristics) and social resources work together to determine the extent to which one thrives, or experiences growth and positive functioning in any given setting. Conversely, a developmental perspective of thriving has also been forwarded in reference to adolescents’ accrual of contextual/environmental resources that foster their continuous progression toward their optimal development which involves more than the attainment of what is needed to “get by” (Benson & Scales, 2009).

Student thriving in the current study will adopt a definition present throughout the work literature. In their landmark article, Spreitzer and colleagues (2005) used the work environment as a contextual anchor for forwarding their generalizable construct of thriving. They proposed a two-dimensional model of thriving that requires the simultaneous experience of vitality and learning. Under this definition, vitality can be understood as the sense that one feels energized (Nix, Ryan, Manly, & Deci, 1999), passionate regarding their work tasks (Miller & Stiver, 1997), which reflect feelings of aliveness stemming from one’s own intentional actions (Spreitzer et al., 2005). The dimension of learning can be understood as the acquisition and
application of knowledge and skill (Elliot & Dweck, 1988) such that one becomes more confident and capable (Carver, 1998). Together, these two components capture the affective aspect (vitality) and the cognitive aspect (learning) of the psychological experience of personal growth (Porath et al., 2012). These two elements are consistent with previous explanations of the subjective experience of thriving that center on the multi-faceted experience of enlivening self-expansion (Carver, 1998; Ryff, 1989). Specifically addressing their conceptualization of thriving, Spreitzer and colleagues (2005) described the joint experience of vitality and learning as communicating “a sense of progress of forward movement in one’s self-development” (p. 538).

Spreitzer and colleagues (2005) justified this conceptualization using two primary reasons. First, they note the necessity of including both an affective and cognitive element in thriving as psychological experience involves both components. Second, Spreitzer and colleagues (2005) argue that this definition of thriving captures both of the predominate perspectives of psychological functioning: hedonia and eudaimonia (Ryan & Deci, 2001). Ryan and Deci (2001) assert research on psychological functioning has been derived using two fundamental approaches: the hedonic perspective which is rooted in happiness and defined in terms of the ability to acquire pleasure and avoid pain; and the eudaimonic approach which they define as self-actualization or reaching one’s full potential in life by finding one’s purpose. According to Spreitzer and colleagues (2005), the hedonic perspective is captured in the vitality component of thriving while the eudaimonic perspective is reflected in the learning component. From this perspective, thriving can be seen as a broader indicator of well-being. While subjective well-being as traditionally been defined as the extent to which individuals judge their lives positively (Diener et al., 1999), such a definition focuses primarily on the individual’s emotional responses to their life circumstances and their overall or domain-specific satisfaction, utilizing a
primarily hedonic perspective. In contrast, this conceptualization of thriving incorporates both hedonic and eudaimonic elements to provide a more comprehensive indicator of human functioning.

It is important to highlight this conceptualization of thriving as the joint experience of vitality and learning. Spreitzer and colleagues (2005) emphasize the presence of both components as necessary for the experience to meet their criteria for the experience of thriving. They note that individuals may experience learning while feeling emotionally depleted and disengaged from the activity. Conversely, they explain that individuals may experience vitality at work while lacking a sense that they are expanding their knowledge base or skillset. Such an individual may feel emotionally enlivened due to their environment but feel stunted in their self-development (Spreitzer et al., 2005). Neither of these individuals would be thriving as thriving represents the combined experience of both components.

Important for the current investigation, Spreitzer and colleagues (2005) offer two foundational assumptions for their conceptualization of thriving. First, they posit that the environment plays a role in fostering thriving but that thriving is not cultivated through merely the removal of stressors. Rather, it involves the creation of environmental circumstances that produce specific psychological states, behaviors, and resources that lead to thriving (Spreitzer et al., 2005). Second, the authors acknowledge individual traits may also predispose some individuals to the experience of thriving. In offering these assumptions, Spreitzer and colleagues (2005) implicate both the environment and individual as having a role in the production of thriving. The current study seeks to explore the relationship between within-person variables to elucidate how personal attributes may influence how one interprets environmental factors that may result in the experience of thriving.
While thriving conceptualized as the joint experience of vitality and learning has not been investigated using a student sample, a recent meta-analysis was used to examine the relation between thriving and several important work-related outcomes. Kleine, Rudolph, and Zacher (2018), providing all effect sizes as sample size-weighted and reliability-corrected correlations ($r_c$), found thriving to positively relate to subjective health ($r_c = .39$, 95% CI = .36 - .43, $k = 3$, $N = 532$) and negatively relate to feelings of burnout ($r_c = -.53$, 95% CI = -.69 - -.37, $k = 6$, $N = 1,951$) among workers. Further, Kleine and colleagues (2019) observed thriving to significantly relate to important work-related attitude constructs such as job satisfaction ($r_c = .64$, 95% CI = .50 - .78, $k = 7$, $N = 2,798$), commitment to work ($r_c = .65$, 95% CI = .50 - .80, $k = 8$, $N = 1,766$), positive attitude toward self-development ($r_c = .52$, 95% CI = .26 - .78, $k = 5$, $N = 1,139$), and turnover intention ($r_c = -.29$, 95% CI = -.36 - -.22, $k = 6$, $N = 1,750$). Kleine and colleagues (2019) also observed positive relationships between thriving and important performance indicators including organizational citizenship behavior ($r_c = .43$, 95% CI = .33 - .53, $k = 6$, $N = 1,975$) and creative performance ($r_c = .58$, 95% CI = .45 - .71, $k = 6$, $N = 2,054$). They also noted that thriving overall as well as both subcomponents of the construct, namely vitality and learning, related positively with task performance (thriving overall: $r_c = .35$, 95% CI = .28 - .41, $k = 15$, $N = 4,894$; vitality: $r_c = .32$, 95% CI = .24 - .40, $k = 3$, $N = 1,228$; learning: $r_c = .3$, 95% CI = .27 - .36, $k = 3$, $N = 1,228$). While these findings stem from investigations of workers, the outcomes thriving has been shown to significantly predict also seem relevant to college students. For example, tasked with learning while embedded in a demanding, productivity-oriented academic environment, students must also complete assigned tasks, engage in creative performance, and participate in the larger campus community similar to the organizational environment. Further, the academic environment has also been shown to significantly impact the
attitudes of students as demonstrated by their intentions to transfer or their intent to graduate (Schreiner, 2010a). Moreover, the construct of burnout is a phenomenon that is also relevant to the college student experience (Schaufeli et al., 2002) and will be discussed at length in a later section.

It is important to acknowledge previous work attempting to forward a conceptualization of thriving relevant for college students. Schreiner (2010a) proposed the global experience of thriving in college students involved experiencing optimal functioning academically, interpersonally, and intrapersonally. To assess thriving in these three areas, Schreiner offered the Thriving Quotient, a 35-item measure intended to capture 5 factors Schreiner argued represented the experience of thriving among college students: 1) engaged learning, 2) academic determination, 3) positive perspective, 4) diverse citizenship, and 5) social connectedness (Schreiner, 2010a). Engaged learning and academic determination represented academic thriving, positive perspective indicated intrapersonal thriving, and both diverse citizenship and social connectedness indicated interpersonal thriving (Schreiner 2010a, 2010b, 2010c). However, none of these articles offered empirical data supporting this conceptualization of thriving among college students. Schreiner briefly alludes to empirical findings but provides no descriptive statistics or effects sizes supporting her measurement of student thriving. Moreover, only two empirical investigations in low impact journal (i.e., Christian Higher Education; IF = 0.17; 2019) were located that used Schreiner’s (2010a) conceptualization. They showed thriving as marginally significant for predicting perceived return on tuition (Conn, 2017) and intent to graduate (Ash & Schreiner, 2016).

Because the post-secondary education environment requires students to engage at a high level in order to maximize the amount of knowledge they obtain, students face an increasing
expectation to perform under great demand. As such, it is important to identify factors that allow students to maintain the energy necessary to engage in the academic environment while also sustaining their ability to acquire knowledge and skill from their academic experience. As a personal growth indicator comprised of vitality and learning, thriving (Spreitzer et al., 2005) represents the perfect construct for examining college student well-being. Accordingly, Spreitzer and colleagues’ (2005) conceptualization of thriving will be utilized as a positive indicator of student well-being in the current study.

**Summary**

Given the inclusion of the positive affective state of vitality along with the cognitive component of learning within its definition, thriving represents an important indicator of well-being relevant to the college student experience. The utility of this construct in the work literature suggests it may be linked to important outcomes in student samples. This study examined two within-person variables that may foster the experience of student thriving and explain how this relationship may occur. The next section introduces a negative indicator of student well-being that is also contextually relevant to the student experience.

**Student Burnout**

The idea of burnout was initially forwarded by Freudenberger (1975) and Maslach (1976). Freudenberger (1975) provided the earliest account of his and other experiences of becoming emotionally depleted at work as experiencing a subsequent decline in motivation and commitment to one’s work. Perhaps the most influential researcher in the field, Maslach (1976) conducted qualitative interviews among healthcare professionals regarding their experience of emotional stress in their jobs and noted the experience of stress to impact job behavior. In their seminal article on the topic, Maslach and Jackson (1981) describe burnout as a multidimensional
phenomenon that emerges frequently in professional staff occupying human service professions such as medical doctors, psychologists, nurses, or social workers. They posit that burnout is the experience of emotional exhaustion, cynicism, and personal inefficacy, particularly with regard to one’s work (Maslach & Jackson, 1981).

Maslach and Jackson (1981) described emotional exhaustion, the primary affective component of burnout, as the feeling that one’s emotional resources are depleted which renders the individual unable to invest themselves in their work. Framed to describe the human service industry, cynicism was defined as depersonalization or negative attitudes and feelings about one’s clients (Maslach & Jackson, 1981). Maslach (2001) later provided a broader definition of depersonalization in describing this facet of burnout as “an attempt to put distance between oneself and service recipients by actively ignoring the qualities that make them unique and engaging people” (p. 403). Outside of the human service industry, people demonstrate cynicism by engaging in cognitive distancing that manifests as indifference. Distancing one’s self from work responsibilities in this manner render one’s workload more manageable. From this perspective, the cynicism component of burnout can be view as an attempt to cope with one’s depleted emotional resources. The final component of burnout, inefficacy, involves the “tendency to evaluate one’s self negatively with regard to one’s work” and feeling “unhappy about themselves and dissatisfied with their accomplishments on the job” (Maslach & Jackson, 1981, p. 99). Inefficacy is viewed to result from the presence of both emotional exhaustion and cynicism. Despite the presence of three unique subfactors present in the burnout experience, Maslach (2001) posited all three facets are necessary for correctly characterizing the phenomenon and viewing any one of the three facets in isolation would be to misconstrue the
construct. As such, the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981), became a widely used measure to assess for burnout in vocational populations (Schaufeli et al., 2002).

Extending the construct of burnout beyond the work literature, examinations of student samples (e.g., Balogun et al., 1996; Gold & Michael, 1985) determined the multi-dimensional structure of burnout forwarded by Maslach and Jackson (1981) to be applicable to the student experience of academic life. Tasks regularly encountered by students such as test taking, attending class, and completing homework assignments can be viewed as work (Shin et al., 2011). As such, it is a reasonable assumption that students experience reactions to environmental demands similar to those experienced by workers within job settings. In order to bring clarity to the examination of burnout among college students, Schaufeli and colleagues (2002) developed a student survey version of the MBI (i.e., the MBI-SS) and assessed the construct using a cross-national sample of university students from three countries. Defining the three factors of burnout forwarded by Maslach and Jackson (1981) to capture the student experience, Schaufeli and colleagues (2002) defined student burnout as “feeling [emotionally] exhausted because of study demands, having a cynical attitude toward one’s studies, and feeling incompetent as a student” (p. 465). In this landmark study, the three-dimensional model of burnout was observed to be a good fit to the data among students from Spain ($N = 623; \chi^2 = 209.48, df = 81, p < .001, TLI = .94, CFI = .95, RMSEA=.05$), Portugal ($N = 727; \chi^2 = 280.00, df = 82, p < .001, TLI = .92, CFI = .94, RMSEA=.06$), and the Netherlands ($N = 311; \chi^2 = 127.14, df = 83, p < .001, TLI = .96, CFI = .97, RMSEA=.04$). Furthermore, Shin and colleagues (2011) further validated Maslach and Jackson’s (1981) three-factor of structure of burnout using a sample of 947 Korean middle and high school students ($\chi^2 = 394.48, df = 86, p < .01, CFI = .95, RMSEA=.061$), lending further support to the utility of the construct in academic settings.
The relevance of burnout for student outcomes has garnered significant support in the literature. Specifically, eleven total studies were located that provided quantifying the relationship between student burnout and important student consequences. Three of those studies described the relationship between burnout and important measures of student performance. First, Neumann, Finaly-Neumann, and Reichel (1990) used regression analyses in a sample of 200 third- and fourth-year students from a northeastern U.S. university to demonstrate mean response scores on the emotional exhaustion subscale of the MBI, capturing a core component of student burnout, as significantly and negatively predicting students’ sense of having achieved worthwhile things in college ($\beta = .23$, $p < .05$). Further, Schaufeli and colleagues (2002), using a multi-national sample of college students, observed mean self-inefficacy scores in all three samples to significantly negatively correlate with academic success (i.e., the proportion of taken exams that were successfully passed) among their Spanish sample ($N = 623; r = -.34$, $p < .001$), their Portuguese sample ($N = 727; r = -.12$, $p < .05$) and their Dutch sample ($N = 311; r = -.33$, $p < .001$). Moreover, emotional exhaustion and cynicism significantly negatively correlated with academic success in their Spanish sample (emotional exhaustion: $r = -.12$, $p < .01$; cynicism: $r = -.19$, $p < .001$) but not the other two samples. Similarly, Yang (2004) found student total burnout scores to be significantly, negatively predictive of grade point average albeit nominally ($\beta = -.07$, $p < .05$) in his sample of 1034 freshman students at vocational-technical universities in Taiwan.

Four studies were located describing the relationship between burnout and outcomes relevant to student behavior. First, Dyrebye and colleagues (2008) used odds ratios to examine the relationship between burnout and suicidal ideation in 2248 medical students in the United States and determined students who were feeling burnt out (as indicated by a score of 27 or higher of the emotional exhaustion index and/or a score of 10 or higher on the cynicism index of
the MBI-SS; criteria consistent with the standard described by Maslach, Jackson, & Leiter, 1996) were two to three times more likely to experience suicidal ideation than students who were not experiencing burnout (odds ratio = 3.46; 95% CI: 2.55 to 4.69; p < 0.001). Second, Dyrebye and colleagues (2010) used an additional sample of 2,566 medical students to find that students experiencing burnout were more likely than those who were not experiencing burnout to engage in one or more unprofessional behaviors (e.g., dishonest academic behavior, unprofessional conduct related to patient care, inappropriate relationships with industry such as willing engaging in conflicts of interest) (35% vs 21.9%; odds ratio: 1.89; 95% CI: 1.59-2.24; p < .05). The authors also found individuals experiencing burnout to be less likely than students not experiencing burnout to hold altruistic views regarding physicians’ responsibility to serve society (79.3% vs 85.0%; odds ratio: 0.68; 95% CI: 0.55-0.83; p < .05). Third, Moneta (2011) found a model using the three components of burnout as mediators of the relationship between students need for achievement and intention to leave their university to be a good fit to the data collected from 226 undergraduate students in London ($\chi^2 = 115.35$, df = 82, p < 0.009; CFI = .98; RMSEA = .043), highlighting the connection between student burnout and intentions to transfer. Further, the structural equation model demonstrated cynicism ($\beta = .56$, p < .001) and self-inefficacy ($\beta = .18$, p < .05) among the students to significantly predict intentions to leave their institution (Moneta, 2011). Fourth, Mazurkiewicz, Korenstein, Fallar, and Ripp (2012) used multiple comparison chi-square testing among their 86 participants to identify significant differences (p < .05) in proportions of individuals endorsing burnout-related experiences. The authors found students meeting criteria for burnout were significantly more likely to suffer from sleep deprivation (p = .0359), to perceive less control over their daily schedule (p = .03), and to feel
less confident about obtaining the knowledge and skills necessary to become an intern upon graduation ($p = .0263$; Mazurkiewicz et al., 2012).

Four studies were located that provided evidence for psychological implications of burnout. Using a correlational design and a sample of 149 undergraduate students at a private midwestern institution, Jacobs and Dodd (2003) found all three dimensions of burnout to be significantly positively related with subjective experience of one’s workload ($r’s = .24 -.43, p’s < .05$), indicating burnout may lead people to experience their workloads as more difficult to manage as compared to non-burnt out peers. Similar results were obtained by Robins, Roberts, and Sarris (2015) in their sample of 260 health profession students from 10 Australian universities. They observed emotional exhaustion to positively relate with one’s subjective perceptions of workload ($r = .41, p < .01$). Such findings underscore the impact burnout may have on student motivation and perceived ability to complete academic tasks. Additionally, Zhang, Gan, and Cham (2007) used structural equation modeling and a sample of 482 Chinese undergraduates to show burnout as indicated by total scores on the exhaustion, cynicism, and self-inefficacy subscales of the MBI-SS, as negatively associated with student perceptions of engagement in their studies ($r = -.20, p < .05$) which was conceptualized as experiences of vigor, dedication, and absorption with one’s studies. Finally, Gan, Shang, and Zhang (2007) found emotional exhaustion ($r = -.142, p < .05$), cynicism ($r = -.179, p < .01$), and self-inefficacy ($r = -.38, p < .01$) to each be negatively correlated with perceived coping effectiveness in their sample of 273 Chinese college students. This finding suggests experiences of burnout carry implications for one’s perceptions of one’s own ability to manage stress.

While all three burnout subcomponents have been demonstrated to significantly predict important student outcomes, there is some evidence to suggest self-inefficacy may function
differently than emotional exhaustion and cynicism. Specifically, studies have consistently found correlations between self-inefficacy and the other two burnout factors to be lower than correlations between emotional exhaustion and cynicism (e.g., Poghosyan, Aiken, & Sloane, 2009; Schaufeli et al., 2002; Zhang et al., 2007). Schaufeli and Taris (2005) attempted to explain for this consistent difference by describing the three subcomponents of burnout as emerging sequentially with emotional exhaustion occurring as a reaction to one’s environment, cynicism developing as a coping strategy for managing exhaustion, and self-inefficacy occurring as a result of increased cynicism. Schaufeli and Taris (2005) acknowledge that self-inefficacy may not be part of the burnout syndrome but rather a consequence of burnout.

Furthermore, the theoretical model offered in the current study posits a conceptually similar core construct (i.e., perceived academic competence) as mediating the relationship between within-person resilience variables and student thriving and student burnout. From this perspective, student efficacy represents a predictor of student burnout rather than a burnout subcomponent. The conceptual redundancy between perceived academic competence and self-inefficacy provided further justification for conceptualizing student burnout as emotional exhaustion and cynicism.

As such, student burnout in the current study will be operationalized using the emotional exhaustion and cynicism subscales of the MBI-SS. Burnout conceptualized in this manner has garnered support in the student burnout literature using a single scale comprised of exhaustion and cynicism items (Sulea, van Beek, Sarbescu, Virga, & Schaufeli, 2015; van Beek, Taris, & Schaufeli, 2011). Burnout measured in this manner has also demonstrated excellent internal consistency ($\alpha$s = .92 & .92, respectively).
Summary

Taken together, this section highlights the importance of understanding the experience of burnout among students as this phenomenon has been linked with outcomes relevant not only to student performance but student health. Because emotional exhaustion and cynicism have designated in the literature as the core components of burnout (Schaufeli & Taris, 2005), these two subconstructs comprised the present conceptualization of student burnout and were used in the current study as a negative indicator of student well-being. The following two sections will present within-person resilience variables which may serve as protective agents against burnout while promoting the experience of thriving among students.

Dispositional Optimism

Turn of the century research in the study of human behavior has seen a growing emphasis on positive psychology. As described by Seligman and Csikszentmihalyi (2000), positive psychology is a science of positive subjective experience, positive individual traits, and positive institutions aimed at improving human quality of life. At the individual level, positive psychology aims to identify the traits that result in valued subjective experiences such as well-being, contentment, and satisfaction (Seligman & Csikszentmihalyi, 2000). One trait that has garnered much attention in the literature is optimism. Optimism was originally defined in the anthropology literature as “a mood or attitude associated with an expectation about the social or material future—one which the evaluator regards as socially desirable, to his or her advantage, or for his or her pleasure” (Tiger, 1979). Under such a definition, optimism does not represent a content-specific construct. Rather, optimism hinges on what the individual views as desirable (Peterson, 2000). According to Peterson (2000), optimism involves both cognitive and emotional
elements and plays an important role in motivation and thereby directs both one’s behavior and their interpretation of environmental circumstances.

While optimism has been examined as an aspect of human nature, most relevant to the current study is the work exploring optimism as an individual difference variable that people possess to varying degrees. Peterson (2000) proposes that one’s experiences influence the degree to which one is optimistic (p. 46). This portrayal of optimism as a malleable belief concept is based in early work describing how beliefs influence individual’s behavior (e.g., Adler, 1964; Kelly, 1955; Rotter, 1954). Further, optimism has been characterized most often in the literature as “a generalized expectation that influences any and all psychological processes in which learning is involved” (Peterson, 2000; p.47). Moreover, optimism can be understood as a perspective one takes when interpreting and anticipating interactions with one’s environment. A primary vein of optimism research has characterized optimism as dispositional in that individuals possess an inherent level of optimism. Dispositional optimism has been defined as a global expectation that good things will be plentiful in the future and bad things will occur infrequently (Scheier & Carver, 1992). Using optimism as an affective anchor, human behavior can be characterized as the pursuit of desirable outcomes such that individuals identify and adopt goals and regulate subsequent actions to pursue said goals. Carver and Scheier (1981) argue that individuals hold an optimistic perspective when they believe goals will be achieved despite encountering adversity. Dispositional optimism enables individuals to view impediments to goals as surmountable. As such, dispositional optimism moves individuals to persist in goal pursuit despite perceived or encountered obstacles. From this perspective, dispositional optimism represents a resilience variable facilitating self-regulated goal pursuit.
Dispositional Optimism and Thriving

In a recent review of the construct of thriving, Brown and colleagues (2017) identified a positive perspective as an important within-individual antecedent to thriving, noting that an optimistic perspective can serve as an enabler of vitality and learning when engaged in a given task. Carver (1998) and Park (1998) elaborate on this perspective in their descriptions of optimism as a resilience variable that fosters a focus on one’s task despite experiences of adversity. Additionally, Niessen and colleagues (2012) advocated for further investigation of optimism as a predictor of human thriving, speculating that worker’s perceptions of vitality of learning may hinge on the presence of a positive perspective.

Despite the implication of optimism as a possible precursor to thriving, only three studies were located that empirically examined the relationship of optimism-related constructs in predicting the psychological experience of thriving. One of these studies (Sarkar & Fletcher, 2014) used a qualitative approach to examine themes consistently associated with the experience of thriving in among high achieving athletes and found optimism and positive perspective to be one of five consistent themes across athlete narratives. A second study (Paterson, Luthans, & Jeung, 2014) quantitatively examined the relationship between psychological capital—a resource-based resilience variable that includes dispositional optimism—and thriving conceptualized as the joint experience of thriving and learning. The authors observed psychological capital to correlate positively with thriving ($r = .58, p < .01$) in their sample of 600 business management students (Paterson, et al., 2014). A third study (Hamby, Grych, & Banyard, 2018) examined the relationship between optimism and thriving (defined in this study as enhanced well-being following an adverse life event) in their sample of 2,565 adults and
adolescents. The authors observed a relatively weak but significant positive correlation between optimism and thriving ($r = .14, p < .01$).

Because thriving in the current study has been defined as the joint experience of learning and vitality, studies examining the relationship between optimism and both subcomponents of thriving were also reviewed. Five studies were located examining the relationship between optimism and indicators of student learning. In one study, Medlin and Faulk (2011) found optimism to be positively correlated with perceived academic performance (i.e., student perceptions of academic growth and goal accomplishment) in their sample of 145 undergraduate students ($r = .54, p < .001$). An additional study using undergraduate sample of 103 students observed a positive correlation between dispositional optimism and students’ cumulative grade point average at two-year follow-up ($r = .22, p < .05$; Prola & Stern, 1984). Similarly, Ruthig, Haynes, Perry, and Chipperfield (2007) found optimism to correlated with both cumulative grade point average ($r = .32, p < .001$) and perceived success, a construct reflecting satisfaction with learning performance ($r = .28, p < .001$) among their sample of 640 Canadian first-year undergraduates. A fourth study conceptualizing dispositional optimism as a lack of pessimism found lower levels of pessimism to be associated with higher grade point averages ($r = -.15, p = .044$) in their sample of 235 undergraduate students (Maleva, Westcott, McKellop, McLaughlin, Widman, & College, 2014). Finally, a fifth study used a series of analyses of variance to examine the effects of achievement explanatory style on important student outcomes. Compared to students with other achievement styles, students with an optimistic explanatory style (e.g., a disposition to expect success, positive outcomes, and positive experiences) passed more courses ($F = 2.31, p < .05$) and were more satisfied with their academic achievement gains, a construct reflecting perceived learning ($F = 7.88, p = .001$).
Additionally, six studies were located that captured the relationship between dispositional optimism and vitality in a variety of settings. In the only study located using a student sample (Posadzki, Musonda, Debska, & Polczyk, 2009), students’ level of dispositional optimism significantly predicted students’ energy and vitality ($\beta = .309, p = .031$). Optimism was also found to significantly correlate ($r = .60, p < .01$) with vitality among 1237 men participating in an aging adults study (Achat, Kawchi, Spiro III, Demolles, & Sparrow, 2000). Similarly, optimism correlated with vitality ($r = .57, p < .001$) among 3000 Spanish adults (Merino & Privado, 2015). In a study examining predictors of vitality at work among 108 dementia caregivers, optimism was a significant, positive predictor of vitality ($\beta = .41, t = 5.07, p < .001$).

Two studies were located examining the relationship between optimism and psychological vitality among individuals with chronic health conditions. Alterman and colleagues (2010) observed optimism to positively correlate with vitality at $r = .50 (p < .001)$ in their sample of substance abuse patients while Pular, Alcalá, Reyes del Paso (2015) observed optimism to significantly predict vitality ($\beta = .29, p = .009$) in their sample of 69 hematological cancer patients.

**Dispositional Optimism and Student Burnout**

Further portraying dispositional optimism as a resilience variable that insulates one from negative psychological experiences, five studies were located describing the relationship between dispositional optimism and burnout using samples of college students. Using a sample of 233 working students, Chang, Rand, and Strunk (2000) observed dispositional optimism to negatively relate to both emotional exhaustion ($r = -.32, p < .001$) and cynicism ($r = -.35, p < .001$) and positively relate to efficacy ($r = .35, p < .001$). Further, Kluemper, Little, and Degroot (2009) found trait optimism to significantly, negatively correlate with burnout conceptualized as
emotional exhaustion ($r = -.41, p < .001$) using a sample of 261 college students. Using regression analyses, an additional study observed dispositional optimism to significantly predict emotional exhaustion ($\beta = -.11, p < .05$) but not cynicism ($p > .05$) using a sample of 463 college students (Vizoso-Gómez and Arias- Gundín, 2018). One study examining burnout among medical students observed that of 119 students experiencing burnout, only 40 (33.6%) identified themselves as optimistic people while 79 (66.4%) denied being optimistic. When assessed with a Mann-Whitney U test, these proportions were significantly different ($p < .05$) suggesting optimism may render students less likely to experience burnout. Further, Vizoso, Arias-Gundín, and Rodríguez (2019) replicated earlier findings when they used structural equation modeling to determine dispositional optimism significantly negatively predicted the emotional exhaustion ($\beta = -.09, p < .05$) component of burnout among 532 Spanish undergraduate students. The authors also observed dispositional optimism to negatively correlate with cynicism ($r = -.17, p < .001$) in this same sample (Vizoso, et al., 2019).

Relatedly, an additional study was located that employed a longitudinal design to examine the relationship between optimism and burnout (Salmela-Aro, Tolvanen, & Nurmi, 2009). Using latent growth curve modeling, Salmela-Aro, Tolvanen, and Nurmi (2009) observed high levels of optimism during undergraduate study significantly predicted lower levels of job burnout at 10-, 14-, and 17-year follow-up using a total burnout score incorporating all three subscales of the MBI among their sample of 292 undergraduate students. The model for the relationships between these variables was a good fit to the data ($\chi^2 (87) = 111.05, p = .04$, CFI = .98, TLI = .98, RMSEA = .029 and SRMR = .051). This study indicates that dispositional optimism may serve as a long-term protective factor against burnout beyond the academic setting.
Summary

The above sections demonstrate the utility of dispositional optimism in predicting the occurrence of experiences of thriving and burnout among students. Dispositional optimism represents an affective resilience factor that may enable students to remain engaged in their academic work. Because dispositional optimism centers on the anticipation of positive outcomes, this construct may correlate negatively with painful psychological experiences and thereby predict students’ ability to persist despite any adversity experienced during their academic journey. In the following sections, a cognitively based resilience variable (i.e., cognitive reappraisal) will be reviewed and demonstrated as also useful in predicting thriving and burnout among college students.

Cognitive Reappraisal

The management of emotional reactions has been an important area of exploration and thought since the dawn of psychology as emotions have been recognized as carrying both adaptive value and detrimental consequences (Gross, 2008). Psychologists and philosophers have for centuries examined whether emotions should be attended to, disregarded, encouraged, or suppressed (Gross, 1998b). These examinations have been formalized into the current psychological field of emotion regulation (Gross, 1999).

Rooted in James’ (1884) early conceptualization of emotions as response tendencies that serve an adaptive purpose, the field of emotion regulation rests on the contention that emotional reactions can be altered by intervening at different points “along the timeline of an unfolding emotional response” (Gross & John, 2003, pp. 348). In their seminal article distinguishing emotion regulation strategies, Gross and John (2003) describe the process of emotion generation as stemming from the evaluation of emotional cues that trigger emotional response tendencies
consisting of experiential, physiological, and behavioral response systems. The authors propose emotion response tendencies can be modulated in ways that differ as a function of when the modulation occurs. As such, Gross and John (2003) proposed emotion regulation strategies can be categorized as antecedent-focused (efforts taken before the emotion response tendency becomes fully activated) and response focused (efforts taken after an emotional response unfolds) strategies.

One antecedent-focused strategy that has garnered significant attention in the extant literature has been cognitive reappraisal. Cognitive reappraisal has been defined as a form of cognitive change involving construal of a potentially emotion-eliciting situation in a way that changes the emotional impact occurring as a result of the situation (Lazarus & Alfert, 1964). For example, if expected to give an oral presentation in front of a large lecture course, a student might alter their view of the situation to represent an opportunity to share information with classmates rather than an evaluation of their competence in public speaking. From this perspective, cognitive reappraisal represents a thought-oriented strategy that alters the impact of an emotion by changing the perceptive or evaluative thoughts that give rise to the emotion (Gross, 1998a, 2000). Cognitive reappraisal may be used to reduce the impact of a painful emotion or enhance the effect of a positive emotion prior to or during the beginning of an emotional experience (Katana, Röcke, Spain, & Allemand, 2019). Similar to dispositional optimism, cognitive reappraisal has been characterized as a resilience variable (Gross, 1998a) that may allow individuals to persist in their pursuit of goals despite experiencing setbacks. While dispositional optimism represents a passive, affective-based protective factor, cognitive reappraisal represents a more active, cognitively based strategy for managing difficult emotions that may otherwise prevent students from thriving and increasing their likelihood of burnout.
Cognitive Reappraisal and Thriving

No studies were located that have examined the relationship between cognitive reappraisal and thriving. However, six articles were located examining the subcomponents of thriving as defined in the current study. Two of those studies (Shahane & Denny, 2019; Wang, Li, Hu, Dong, & Tao, 2017) investigated the relationship between cognitive reappraisal and psychological well-being using a conceptualization of well-being that included a subscale of vitality. Shahane and Denny (2019) used a correlational design to demonstrate linguistic distancing, a specific cognitive reappraisal technique was significant correlated with a measure of general well-being that included energy, vitality, and emotional wellness ($r = 0.41, p < 0.05, 95\% \text{ CI}[0.076, 0.667]$) in their sample of 94 undergraduate students. Wang and colleagues (2017) conducted moderation analyses in their sample of 877 Chinese students and noted cognitive reappraisal was positive correlated with their index of well-being that included a “life vitality” scale capturing feelings of youthfulness and energy ($r = .367, p < .01$). Further, Wang and colleagues (2017) observed the relationship between negative academic emotion (e.g., anger, anxiety, shame, boredom, hopelessness) and well-being to be insignificant among individuals with a cognitive reappraisal score one standard deviation above the sample mean. This finding suggests cognitive reappraisal ability may serve as a protective factor that allows one to maintain a sense of well-being despite negative emotions associated with academic demand (Wang et al., 2017).

Four articles were located describing the relationship between cognitive reappraisal and indicators of student learning (Cavanagh, Lang, Birk, Fulwiler, & Urry, 2019; Leroy, Grégoire, Magen, Gross, & Mikolajczak, 2012; Spann, Shute, Rahimi, & D’Mello, 2019; Strain & D’Mello, 2015). In their sample of 226 undergraduate students, Cavanagh and colleagues (2019)
used analyses of variance to investigate the effect of emotion regulation techniques on long-term learning and found individuals assigned to the cognitive reappraisal experimental group to perform significantly better than students assigned to a mindfulness group and the control group on long-term learning measures \( F(2, 139) = 4.50, p = .013, \eta_p^2 = .061 \). Similarly, Spann and colleagues (2019) found dispositional cognitive reappraisal use to correlate positively with physics post-test scores \( r = .66, p < .001 \) in a study assessing the utility of cognitive reappraisal during game-play learning among 110 college students. Additionally, Strain and D’Mello (2015) found emotion regulation condition to have a significant main effect on student engagement \( F(2, 81) = 3.89, \text{MSE} = 0.078, \eta_p^2 = .088 \) such that individuals using cognitive reappraisal to manage their emotions during the learning task reported significantly more engagement in the learning task than those in the control condition (Cohen’s \( d = .63 \)). Finally, Leroy and colleagues (2019) used a sample of 51 college students to assess the utility of cognitive reappraisal in reducing susceptibility to temptation during a memory task. Their results showed that those in the cognitive reappraisal experimental group were better able to sustain enthusiasm for the learning task \( F(1, 49) = 4.95, p < .05, \eta_p^2 = .10 \) and demonstrated more learning during the task \( F(1, 49) = 4.95, p < .05, \eta_p^2 = .10 \) than those in the control condition who were not given instruction to engage in cognitive reappraisal to manage emotions during the memory task. Taken together, these findings suggest cognitive reappraisal may allow for the amelioration of difficult emotions that preclude students from experiencing the engaged learning thereby increasing the likelihood of student thriving.

Because student thriving represents a contextually grounded indicator of student well-being, a relationship between cognitive reappraisal and student well-being also suggests cognitive reappraisal may significantly relate to student thriving. Four studies were located
empirically examining the relationship and indicators of student well-being. First, Soto and colleagues observed cognitive reappraisal usage to positively relate with their index of enhanced psychological functioning (e.g., life satisfaction) among their sample of 425 Latino university students ($\beta = .151, p < .01$). Additionally, Haga, Kraft, and Corby (2009) used regression analyses and a sample of 489 college students to determine cognitive reappraisal positively predicted positive affect ($\beta = .09, p < .05$) and life satisfaction ($\beta = .13, p < .01$). Similarly, Singh and Sharma (2018) found cognitive reappraisal to account for 27% of the variance in the well-being scores of 100 students using cognitive reappraisal as the only predictor ($\beta = .528, t = 5.995, p < .0001$). Finally, Gross and John (2003) observed cognitive reappraisal use to positively predict student well-being indicators such as personal growth ($\beta = .27, p < .05$), purpose in life ($\beta = .25, p < .05$), and life satisfaction ($\beta = .30, p < .05$).

**Cognitive Reappraisal and Burnout**

Cognitive reappraisal has also been identified as a protective factor against experiences of burnout. Three studies were located examining the relationship between cognitive reappraisal and burnout among students. In a recent meta-analysis of the relationship between various emotion-regulation techniques and experiences of burnout, Shin and colleagues (2014) included in the review studies examining the relationship between cognitive reappraisal and burnout. Providing all effect sizes as sample size-weighted and reliability-corrected correlations ($r_c$), Shin and colleagues (2014) found cognitive reappraisal to significantly, negatively predict emotional exhaustion ($r_c = -.15, 95\% CI = -.22, -.07, k = 4, N = 726$), one of the two core components of burnout among students used in the present study. The relationship between cognitive reappraisal and cynicism did not reach statistical significance.
More recently, Seibert, Bauer, May, and Fincham (2017) published an article describing two studies examining the relationship between emotion regulation strategies, burnout, and subsequent academic performance indicators (i.e., grade point average and absenteeism), using the indices of burnout to mediate the relationship between emotion regulation and student performance. In the authors’ first study of 550 undergraduate students, a model that included cognitive reappraisal as a predictor of the three burnout factors was a good fit to the data ($\chi^2(302) = 749.73$, $p < 0.001$, RMSEA = 0.05, CFI = 0.95, SRMR = 0.05). In this model, cognitive reappraisal was significantly, negatively related to cynicism ($\beta = -0.14$, $p < .05$) but did not significantly related to emotional exhaustion ($p > .05$). Seibert and colleagues (2017) sought to expand on these findings in their second study using a different sample of 509 undergraduate students. In this study, the authors examined how emotion regulation, school burnout, and academic outcomes were associated over time. Emotion regulation strategies and burnout were assessed at two timepoints. The authors ran a model examining the mediating role of burnout at time 2 in the relationship between emotion regulation at time 1 and academic outcomes at time 2. This model was a good fit to the data ($\chi^2(302) = 771.00$, $p < 0.001$, RMSEA = 0.06, CFI = 0.95, SRMR = 0.05). Most relevant to the current study, cognitive reappraisal at time 1 was significantly, negatively related to time 2 measures of emotional exhaustion ($\beta = -0.13$, $p < .05$) and cynicism ($\beta = -0.25$, $p < .05$). These findings indicate engaging in cognitive reappraisal not only relates to one’s current experiences of burnout but also carries implications for one’s future levels of burnout.

**Summary**

The above sections emphasize the utility of cognitive reappraisal as a tool for defending against painful emotional experiences. Specifically, cognitive reappraisal has been demonstrated
as an effective technique for altering one’s emotional experience in order to minimize negative emotions while maximizing positive affect. In the current study, cognitive reappraisal may represent a within-person variable positively correlating with student thriving and negatively correlating with student burnout. As demonstrated in the literature, cognitive reappraisal and dispositional optimism represent cognitive and affective resilience factors, respectively, allowing for an interpretation of one’s environment more likely to result in enhanced well-being. In the sections to follow, self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000) will be offered as a theoretical frame for conceptualizing the relationship between the previously described resilience variables (dispositional optimism and cognitive reappraisal) and the indicators of student well-being (student thriving and burnout).

**Self-Determination Theory**

SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) was developed as a macrotheory of human motivation and personality. It attempts to explain how individuals pursue the human tendency for growth, function at an optimal level, and thereby procure a sense of personal well-being. Deci and Ryan (1985) proposed that individuals interact with their environments in an attempt to derive meaning from one’s surroundings and integrating this meaning with one’s personal value system. Specifically, SDT posits that human action exists on a continuum from externally motivated (i.e., actions taken to pursue or avoid consequences aligned with social values) to internally motivated (i.e., actions taken to pursue one’s own desire for mastery or curiosity). According to SDT, environmental or social values become more self-determined as the social values that govern externally motivated action become integrated and internalized into one’s personal value system. From this perspective, individuals actively engage with their environments in a manner that facilitates the development of one’s values (Deci & Ryan, 1985).
Under SDT, as externally rooted values become internalized and behavior becomes self-determined, one experiences an enhanced state of optimal functioning and well-being (Ryan & Deci, 2000). Further, SDT has been used to conceptualize heightened functioning and well-being in a variety of settings and populations including education, counseling, and academia (Deci & Ryan, 2012), thus rendering it a useful frame for understanding the relationships between within-student variables and student well-being conceptualized as thriving and burnout.

**Basic Psychological Needs**

A foundational claim of SDT is that integration of external values and enhanced well-being are facilitated by the satisfaction of three basic psychological needs: volitional autonomy, perceived competence, and perceived relatedness (Ryan & Deci, 2000). Together, these represent three innate desires that, when satisfied, result in development, growth, and well-being. Conversely, frustration of these needs results in maladjustment, underperformance, and psychological ill-being (Vansteenkiste & Ryan, 2013). Further, Basic Psychological Needs Theory (BPNT; Ryan & Deci, 2002), a sub-theory of SDT, asserts need satisfaction relates directly to psychological well-being and fully mediates the relationship between environmental factors and well-being indicators. Further, BPNT conceptualizes the basic psychological needs as universal and transcendent of cultural differences (Ryan & Deci, 2002). Recent investigations utilizing international samples have supported this need structure by finding the basic psychological needs to result in enhanced well-being cross-culturally (Chen et al., 2015; Church et al., 2013).

Although SDT portrays the path to intrinsic motivation and heightened well-being as a dialectical interaction between humans and their environment, much of the extant literature has focused on the ability of environmental support variables to satisfy the basic psychological
needs. Specifically, additional sub-theories of SDT expound on the relationship between contextual factors and the basic psychological needs (e.g., Cognitive Evaluation Theory, Deci & Ryan, 1985; Relationships Motivation Theory, Deci & Ryan, 2014), emphasizing the role of the environment in supporting need satisfaction. However, the role of within-person variables in influencing basic psychological need satisfaction has received little attention in the extant literature. The role of within-person variables becomes particularly important in light of SDT’s emphasis on individuals’ perception of need satisfaction as opposed to objective evaluation of external circumstance (Ryan & Deci, 2000). Within-person variables may shape the way one interprets their environment, thereby influencing the extent to which the basic psychological needs are satisfied and the subsequently experienced level of well-being.

To explicate this relationship, the current study aimed to examine the utility of the basic psychological needs in mediating the relationship between two resilience variables (i.e., dispositional optimism and cognitive reappraisal) and one positive and one negative indicator of student well-being, namely thriving and burnout, in a sample of undergraduate college students. Because the present study is focused on the well-being indices rooted in academia, participants’ need satisfaction will be measured in the context of their post-secondary education environment. Measurement of SDT’s basic psychological needs have contextualized to examine need satisfaction in a variety of settings including religious/spiritual contexts (Miner et al., 2013) educational venues (Cuevas et al., 2015; Sulea et al., 2015), work settings (Gillet et al., 2015), and athletic participation (Perreault et al., 2007) among others (Deci & Ryan, 2012). The following sections introduce and define each basic psychological need within the context of post-secondary academia and provide empirical support for their utility in mediating the relationship between the within-person variables and student well-being.
**Academic volitional autonomy.** Volitional autonomy is defined as a sense that one is able to make and pursue one’s own choices (Ryan & Deci, 2000). In the current context, academic volitional autonomy involves students’ perceptions of their ability to make and pursue choices related to their educational responsibilities.

**Relation to dispositional optimism.** Five studies were located that explicitly addressed the relationship between dispositional optimism and indices of volitional autonomy. Two of those studies examined this relationship using student samples and contextually relevant indicators of academic volitional autonomy. In a study of 95 first-year undergraduate students, Dawson and Pooley (2013) found dispositional optimism to correlate mildly with perceived promotion of independent functioning \(r = .43, p < .001\) and moderately with perceived promotion of volitional functioning \(r = .39, p < .001\). In this study, promotion of independent functioning and volitional functioning were used as two indicators of student autonomy and both proved to be positively related with dispositional optimism (Dawson & Pooley, 2013).

Additionally, Ruthig, Haynes, Stupnisky, and Perry (2009) found dispositional optimism to positively correlate with perceived academic control at a moderate level \(r = .35, p < .01\) in their sample of 288 first-year undergraduate students. In parallel to the conceptualization of academic volitional autonomy in the current study, perceived academic control was an indicator of the extent to which students perceived themselves to have choice in the context of their academic requirements (Ruthig et al., 2009).

Three additional studies were located that examined the relationship between dispositional optimism and volitional autonomy in general adult samples (Desrumaux, Lapointe, Sima., Boudrias, Savoie, & Brunet, 2015; Ionescu, 2017; Ionescu & Iacob, 2019). In her study of 231 adults, Ionescu (2017) found a relatively moderate correlation between dispositional
optimism and volitional autonomy ($r = .49, p < .01$). In a follow-up study using 566 adults, Ionescu and Iacob (2019) obtained a similar result in finding dispositional optimism to be moderately correlated with volitional autonomy ($r = .50, p < .001$). Finally, Desrumaux and colleagues (2015) performed regression analyses on data collected from a sample of 298 teachers and found dispositional optimism to positively predict volitional autonomy ($\beta = .14, p < .01$).

**Relation to cognitive reappraisal.** As previously mentioned, the relationship between cognitive reappraisal and basic psychological need satisfaction has received little attention in the extant literature, and only one study was found examining the relationship between cognitive reappraisal and academic volitional autonomy using a student sample (Fishman & Husman, 2017). Fishman and Husman (2017) found the use of cognitive reappraisal to significantly predict academic volitional autonomy in their sample of 800 college students ($\beta = .41, p < .01$). An additional study was located that examined the relationship between cognitive reappraisal and volitional autonomy using a non-student sample (Balzarotti, Biassoni, Villani, Prunas, & Velotti, 2016). Balzarotti and colleagues (2016) found the use of cognitive reappraisal to positively predict volitional autonomy in their sample of 470 adults ($r = .27, p < .01$).

**Relation to thriving.** Because the current conceptualization of thriving has been used predominately in studies examining vocational settings, no studies were located examining the relationship between academic volitional autonomy and thriving using a student sample. However, four studies were located examining this relationship using work samples. Using a sample of 928 nursing home social service directors, Liu and Bern-Klug (2013) found perceptions of decision-making autonomy at work to significantly predict thriving at work ($\beta = .28, p < .01$). Similarly, Sia and Duari (2018) found decision-making authority to be strongly correlated with perceptions of thriving at work ($r = .71, p < .001$) among 330 employees, using
the same conceptualization of thriving as the current study. Furthermore, perceived deprivation of autonomy was found to negatively correlate \((r = -.26, p < .05)\) with perceptions of thriving in a sample of 121 American expatriate workers (Ren, Yunlu, Shaffer, & Fodchuk, 2015). Finally, Spreitzer and Porath (2014) found satisfaction of autonomy to be a “significant predictor of thriving” in their sample of 335 workers (p. 18). While they did not provide an effect size for the relationship between volitional autonomy and thriving, Spreitzer and Porath (2014) contend that autonomy was among three basic psychological needs that together accounted for 54% of the variance in perceived thriving.

In an additional study using a sample of 232 adolescent athletes, Gucciardi, Stamatis, and Ntoumanis (2017) found perceived lack of autonomy due to feeling overcontrolled by their coach to negatively impact athletes’ perceptions of thriving. Specifically, the perceived absence of autonomy was negatively correlated with both aspects of the current conceptualization of thriving: vitality \((r = -.33, p < .001)\) and learning \((r = -.41, p < .001)\).

An additional eight studies were located linking volitional autonomy and vitality, the affective component of thriving as conceptualized in the current study. Three of these studies were conducted using samples of college students. Using a sample of 422 college students, Núñez, Fernández, León, and Grijalvo (2015) found academic volitional autonomy to significantly predict student vitality \((\beta = .42, p < .01)\). Vansteenkiste, Lens, Soenens, and Luyckx (2006) also found academic volitional autonomy to significantly predict student vitality in their sample of 121 college students in China \((\beta = .19, p < .01)\). An additional study (Gucciardi, Weixian, Gibson, Ntoumanis, & Ng, 2019) used a single index of basic psychological need satisfaction that included academic volitional autonomy to examine the utility of need satisfaction in predicting student thriving using the conceptualization presented in the current
study. Among their sample of 290 undergraduate students, basic psychological need satisfaction
significantly predicted both vitality ($\beta = .52, p < .001$) and learning ($\beta = .44, p < .001$),
suggesting volitional autonomy may play a significant role in predicting the student thriving. The
current study can expand on these findings by individually examining each of SDT’s basic
psychological needs as predictors of student thriving.

Four studies examined the effect of volitional autonomy on student vitality using samples
of primary school students. Using a sample of 1218 students, Vlachopoulos, Katartzi, and
Kontou (2013) found perceived autonomy to be correlated with vitality among elementary school
students ($n = 401; r = .63, p < .001$), middle school students ($n = 416; r = .58, p < .001$), and high
school students ($n = 401; r = .65, p < .001$). Liu, Bartholomew, and Chung (2017) also found
volitional autonomy to be correlated with vitality ($r = .51, p < .001$) in their sample of 623 high
school students. Two additional studies (Cordeiro, Paixão, Lens, Lacante, & Sheldon, 2016;
Taylor & Lonsdale, 2010) found perceived volitional autonomy to significantly predict student
vitality ($\beta = .14, p < .001$ and $\beta = .11, p < .01$, respectively) in their samples of high school
students.

Finally, Adie, Duda, and Ntoumanis (2008) used structural equation modeling in a
sample of 539 adult athletes to examine the relationship between volitional autonomy and
subjective psychological vitality. Results indicated volitional autonomy significantly predicted
subjective vitality in their sample ($\beta = .24, p < .05$).

Additionally, one study examining the relationship between volitional autonomy and
students’ perceptions of learning was located (Yair, 2000). Using discrepancy comparison in a
sample of 865 middle to high school students, individuals experiencing higher levels of
volitional autonomy in their educational environment compared to individuals experiencing
lower levels of volitional autonomy were also experiencing more perceived learning (discrepancy score = .46). Specifically, students experiencing academic volitional autonomy at a level of one standard deviation above the mean also reported perceptions of learning at .46 standard deviations above the mean for the sample. While these results were not obtained using a sample comprised entirely of college students, they suggest experiencing choice in one’s academic environment may result in enhanced perceptions that one is learning and thereby contribute to greater perceptions of student thriving.

**Relation to burnout.** Five studies were located examining the relationship between academic volitional autonomy and student burnout. Zimmermann, Rösler, Möller, and Köller (2018) used structural equation modeling to examine the relationships among learning conditions and learning burnout and found academic volitional autonomy to negatively predict emotional exhaustion ($\beta = -.19, p < .05$) and cynicism ($\beta = -.13, p < .05$) in their sample of 3,892 education majors. Further, chi-square analyses among 123 medical students indicated a lack of academic volitional autonomy was more prevalent among students experiencing burnout than among the total sample ($p = .03$; Mazurkiewicz, Korenstein, Faller, & Ripp, 2012). In a third study, Ringrose, Houterman, Koops, and Oei (2009) calculated odds ratios among 47 medical residents and determined a lack of autonomy to significantly increase burnout prevalence in their sample (OR = .3, CI: .07 - .95). Using a sample of 225 Romanian students, Sulea, van Beek, Sarbescu, Virga, and Schaufeli (2015) found academic volitional autonomy satisfaction negatively predicted student burnout represented as a total score capturing emotional exhaustion, cynicism, and reduced efficacy ($\beta = -.39, p < .01$). Finally, Shih (2015b), using a sample of 407 adolescent Taiwanese students, found satisfaction of volitional autonomy to be negatively correlated with
emotional exhaustion ($\beta = - .39, p < .01$), cynicism ($\beta = - .44, p < .01$), and lack of personal efficacy ($\beta = - .64, p < .01$).

Two additional studies were located examining the relationship between volitional autonomy and burnout in samples of student-athletes (Martínez-Alvarado, García, & Feltz, 2016; Perreault, Gaudrea, Lapointe, & Lacroix, 2007). In both studies, satisfaction of volitional autonomy was found to negatively predict athlete burnout when burnout was measured as a single index score of all three burnout subcomponents ($\beta = - .70, p < .05$ and $\beta = - .54, p < .01$, respectively).

**Perceived Academic Competence.** Perceived competence is defined as a sense of self-efficacy or mastery over one’s current environment or task (Ryan & Deci, 2000). In the current study, perceived competences will be contextually grounded in one’s schoolwork as a college student and refer to the extent to which one feels a sense of self-efficacy or mastery over their school-related tasks. Because SDT is concerned with capturing the perception of basic psychological needs, measurement of perceived competence will capture students’ subjective experience of themselves as efficacious in their academic role rather than utilizing objective metrics of student achievement. In the review of the relationships between perceived competence and dispositional optimism, cognitive reappraisal, thriving, and burnout forwarded in the following sections, self-efficacy was used interchangeably with perceived competence to ensure a thorough review of the literature.

**Relation to dispositional optimism.** Two studies were located that specifically examined the relationship between dispositional optimism and measures of perceived academic competence (Vizoso-Gómez and Arias-Gundín, 2018; Vizoso, Arias-Gundín, & Rodríguez, 2019). Using regression analyses, an additional study observed dispositional optimism to
significantly predict academic self-efficacy ($\beta = .19, p < .001$) using a sample of 463 college students (Vizoso-Gómez and Arias-Gundín, 2018). Further, Vizoso, Arias-Gundín, and Rodríguez (2019) replicated earlier findings when they used structural equation modeling to determine dispositional optimism significantly positively correlate with academic efficacy ($r = .24, p < .001$) in this same sample (Vizoso, et al., 2019). An additional study was located that utilized a measure of self-efficacy at work. Using a sample of 233 working students, Chang, Rand, and Strunk (2000) observed dispositional optimism to positively relate to work efficacy ($r = .35, p < .001$).

Five additional studies were located capturing the relationship between dispositional optimism and perceived competence to manage general life situations. In a sample of 237 undergraduate students, Fernández-Castro, Rovira, Doval, and Edo (2009) found students’ perceived competence to be strongly correlated with dispositional optimism ($r = .59, p < .001$). Further, Luszczynska, Gutiérrez-Doña and Schwarzer (2005) found dispositional optimism to be correlated with perceptions of general competence to manage life situations across all five of their multinational samples (total $N = 8,796$) with correlations ranging from $r = .5-.6$ (all $p$’s $< .05$). In her study of 231 adults, Ionescu (2017) found a strong correlation between dispositional optimism and perceived competence ($r = .57, p < .01$). In a follow-up study using 566 adults, Ionescu and Iacob (2019) obtained a similar result in finding dispositional optimism to be strongly correlated with perceived competence ($r = .58, p < .01$). Finally, Desrumaux and colleagues (2015) performed regression analyses on data collected from a sample of 298 teachers and found dispositional optimism to positively predict perceived competence ($\beta = .19, p < .01$).

Two additional studies were located describing the relationship between students’ dispositional optimism and self-efficacy. One study found a strong correlation ($r = .51, p < .001$)
between dispositional optimism and self-efficacy in a sample of 204 students (Magaletta & Oliver, 1999). An additional investigation yielded similar results in finding dispositional optimism to significantly predict self-efficacy among 2,578 college students ($\beta = .51$, $t = 16.76$, $p < .001$). Taken together, the dispositional optimism seems to consistently serve as a strong positive predictor of indicators of perceived academic competence.

**Relation to cognitive reappraisal.** One study was located describing the relationship between cognitive reappraisal and a measure of perceived academic competence. Seibert and colleagues (2017) found cognitive reappraisal to significantly, negatively relate to reduced academic efficacy ($\beta = -.29$, $p < .05$). In a second study described in the same publication, Seibert and colleagues (2017) sought to expand on these findings in their second study using a different sample of 509 undergraduate students. The authors found cognitive reappraisal to significantly predict reduced academic self-efficacy ($\beta = -.37$, $p < .05$). These findings suggest cognitive reappraisal may predict students’ academic self-efficacy over time.

Four additional studies were located examining the relationship between cognitive reappraisal and contextually grounded measures of perceived competence. In their recent meta-analysis, Shin and colleagues (2014) found cognitive reappraisal to significantly, negatively predict reduced work self-efficacy ($r = -.15$, 95% CI = -.22, -.07, $k = 4$, $N = 726$). Considered inversely, these results indicate cognitive reappraisal may positively predict work self-efficacy. Cognitive reappraisal was also found to be moderately correlated with perceived self-efficacy to manage errors in academia ($r = .34$, $p < .01$) in a study of the relationship between emotion regulation and learning using a sample of 469 college students (Reindl et al., 2020). Third, Wang and colleagues (2018) found cognitive reappraisal to significantly correlate with job search self-efficacy ($r = .29$, $p < .001$), further highlighting the utility of cognitive reappraisal in predicting
perceptions of perceived competence satisfaction in narrow contexts. The fourth located study examined the relationship between cognitive reappraisal and athletic self-efficacy using a sample of 300 youth athletes recovering from injury (Molina, Oriol, & Mendoza, 2018). Molina and colleagues (2018) found cognitive reappraisal to significantly predict athletes’ self-efficacy in sport ($\beta = .20, p < .001$). Together, these findings suggest cognitive reappraisal can be a useful predictor of measures of perceived competence that are grounded in a specific context. This is particularly relevant to the current study as perceived academic competence represents a context specific measure of students’ perceived ability to successfully fulfill their academic requirements.

Two additional studies were located in which the relationship between cognitive reappraisal and perceived competence to manage general situations was quantitatively examined. Both of those studies used samples comprised of completely of college students (Brewer, Zahniser, & Conley, 2016; Tatnell, Kelada, Hasking, & Martin, 2014). Brewer and colleagues found cognitive reappraisal to positively predict self-efficacy ($\beta = .51, t = 16.76, p < .001$) in their study of emotion regulation and psychosocial adjustment using a sample of 1,568 undergraduate students.). Tatnell and colleagues (2014) also found cognitive reappraisal to significantly correlate with self-efficacy in their sample of 2,637 students during their study of the relationship between within-person variables and non-suicidal self-injury.

**Relation to thriving.** Six studies were located examining the relationship between perceived competence and thriving in various populations. Two of those studies utilized student samples (Bensemmane, Ohana, & Stinglhamber, 2018; Sheldon & Filak, 2008). Bensemmane and colleagues (2018) used a sample of 551 master’s level graduate students to determine that general self-efficacy was significantly correlated with thriving as conceptualized in the current
study \( r = .23, p < .01 \). Sheldon and Filak (2008) found perceived competence for completing a puzzle task to significantly predict their index of thriving that centered on the experience of positive affect during completion of the puzzle task \( \beta = .44, p < .01 \) using a sample of 196 first-year undergraduate students. Three studies examined the relationship between perceived competence at work and thriving as conceptualized in the current study but used samples of non-student workers to do so (Ren et al., 2015; Spreitzer & Porath, 2014; Zhu, Law, Sun, & Yang, 2019). Ren and colleagues (2015) found American expatriates’ lack of competence in delivering cultural instruction to be negatively correlated with perceptions of thriving \( r = -.41, p < .01 \). Additionally, Spreitzer and Porath (2014) found satisfaction of perceived competence to be a “significant predictor of thriving” in their sample of 335 workers (p. 18). While they did not provide an effect size for the relationship between volitional autonomy and thriving, Spreitzer and Porath (2014) contend that perceived competence was among three basic psychological needs that together accounted for 54% of the variance in perceived thriving. Further, Zhu and colleagues (2019) found self-efficacy to significantly correlate with thriving in their sample of 485 workers from various industries \( r = .18, p < .01 \).

An additional study was located examining the relationship between general self-efficacy and psychological thriving. Abraído-Lanza, Guier, and Colón (1998) found general self-efficacy to positively correlate with perceptions of thriving among their sample of 66 Latina women diagnosed with chronic illness. In their study, Abraído-Lanza and colleagues (1998) used a different but conceptually similar definition of thriving than that of the current study, defining it as a sense of personal growth and improved functioning.

Four studies were located examining the relationship between perceived competence and student vitality, the affective subconstruct of thriving. Taylor and Lonsdale (2010) found
perceived academic competence to positively predict vitality among 715 students in China and the United Kingdom ($\beta = .52, p < .001$). Similarly, Mouratidis, Vansteenkiste, Lens, and Sideridis (2008) found perceived competence in completing a physical education task to significantly predict psychological vitality during the task in their sample of 139 students studying physical education (($\beta = .43, p < .05$). Martela and Ryan (2016) also found perceived competence for completing a game-play task to strongly and positively correlate with vitality experienced during the task among the sample of 79 college students ($r = .71, p < .01$).

Furthermore, Vansteenkiste and colleagues (2006) observed general perceived competence satisfaction to positively predict vitality in their sample of 121 college students ($\beta = .25, p < .01$).

**Relation to burnout.** Five studies were located quantitatively describing the relationship between perceived academic competence and student burnout. Examining each subcomponent of student burnout individually, Shih (2015a) found perceived academic competence to be negatively correlated with emotional exhaustion ($r = -.39, p < .01$) and cynicism ($r = -.43, p < .01$) in a sample of 396 students. Similarly, Olwage and Mostert (2014) found general self-efficacy to negatively predict both emotional exhaustion ($\beta = -.35, t = -3.98, p = .001$) and cynicism ($\beta = -.35, t = -3.98, p = .001$) using a sample of 782 full-time students. Three of these studies examined the relationship between perceived competence and burnout using a single index of burnout that included scores on the emotional exhaustion, cynicism, and self-inefficacy subcomponents (Maricuțoiu & Sulea, 2019; Sulea et al., 2015; Yang & Farn, 2005). Sulea and colleagues (2015) found perceived academic competence to negatively predict burnout among a sample of 255 students ($\beta = -.27, p = .01$). Maricuțoiu and Sulea (2019) found general self-efficacy beliefs to be negatively correlated with student burnout among 142 undergraduate students ($r = -.18, p < .05$). In their sample of 517 sophomore management information system
students, Yang and Farn (2005) also found general self-efficacy for managing challenges to negatively correlate with burnout ($r = -.50, p < .001$) and confirmed this finding using regression analyses and controlling for social support and demographic variables ($\beta = -.43, t = -12.06, p < .0001$).

Two additional studies were found examining the relationship between perceived competence and burnout in subjects other than college students. Using 259 student-athletes, Perreault and colleagues (2007) found perceived athletic competence to negatively predict burnout ($\beta = -.22, p < .01$). Using a sample of 227 adult soccer players, Martínez-Alvarado and colleagues (2016) also found perceived athletic competence to negatively correlate with burnout in an athletic setting.

**Perceived campus relatedness.** Under SDT, perceived relatedness is defined as the experience of mutual care between one’s self and the individuals in one’s environment. This involves a sense a connection to others and belonging within one’s social environment (Ryan & Deci, 2000). Consistent with the conceptualizations of academic volitional autonomy and perceived academic competence, the current study will examine students’ perception of relatedness on their college campus without employing any objective measures of the extent to which individuals are related to their academic environment. Perceived campus relatedness refers to the extent to which students feel a sense of mutual closeness and connection with peers on campus.

**Relation to dispositional optimism.** No studies were located examining the relationship between dispositional optimism and relatedness using a sample of college students. Three studies were located establishing a relationship between dispositional optimism and relatedness in adults. Ionescu (2017) found a positive correlation ($r = .49, p < .01$) between dispositional
optimism and relatedness in her sample of 231 adults. In a follow-up study using 566 adults, Ionescu and Iacob (2019) found dispositional optimism to be correlated with perceived relatedness to an even greater degree ($r = .50, p < .01$). Finally, Desrumaux and colleagues (2015) performed regression analyses on data collected from a sample of 298 teachers and found dispositional optimism to positively predict perceived relatedness at work ($\beta = .12, p < .01$).

Relation to cognitive reappraisal. No studies were located that examined the relationship between cognitive reappraisal and an explicit measure of perceived relatedness, thus emphasizing the need for the present study. However, three studies were located quantifying the relationship between cognitive reappraisal and social metrics potentially relevant to perceived relatedness. One study (Balzarotti, Biassoni, Villani, Prunas, & Velotti, 2016) found the use of cognitive reappraisal as an emotion regulation technique to correlate with perceived ability to maintain positive, trusting relationships with peers ($r = .27, p < .01$). A second study (Xia et al., 2014) conducted using 310 middle school students found cognitive reappraisal to positively correlate with self-perceptions of interpersonal flexibility (i.e., the tendency to deal with interpersonal events flexibly and contingently without make global attributions) and interpersonal openness (i.e., tendency to accept other individuals positively). Because these qualities are conducive to positive interactions with others, it may be that cognitive reappraisal enables one to experience more relatedness with peers. Finally, Gross and John (2003) examined the long-term implications of emotion regulation techniques using a sample of 80 undergraduate students. They found cognitive reappraisal to positively predict the sharing of positive ($\beta = .24, p < .05$) and negative ($\beta = .13, p < .05$) emotions with peers, a manner of openness potentially conducive to the perception of connection with others (Gross & John, 2003). Gross and John (2003) also found cognitive reappraisal use to positively predict peer ratings of the individual’s
likeability ($\beta = .37, p < .05$) along with peer perceptions that the individual has close friendships ($\beta = .26, p < .05$). Taken together, these results suggest cognitive reappraisal may predict one’s perception of social relationships in a manner conducive to increasing satisfaction of the need for relatedness.

**Relation to thriving.** Three studies were located explicitly exploring the relationship between perceived relatedness and thriving. One of those studies (Sheldon & Filak, 2008) used a sample of undergraduate students and found relatedness to positively predict their indicator of psychological thriving conceptualized as positive affect experienced in one’s academic environment ($\beta = .20, p < .01$). Two additional studies were found exploring the relationship between perceived and relatedness and thriving as conceptualized in the current study using samples of workers (Ren et al., 2015; Spreitzer & Porath, 2014). Ren and colleagues (2015) found relatedness deprivation to be negatively associated with thriving among 121 American expatriate employees ($r = -.31, p < .05$). Spreitzer and Porath (2014) also found perceived relatedness to significantly predict perceptions of thriving among 335 workers. While they did not provide an effect size for this relationship, the authors asserted perceived relatedness, volitional autonomy, and perceived competence at work accounted for 54% of the variance in worker thriving (Spreitzer & Porath, 2014).

Additionally, seven studies were located describing the relationship between perceived relatedness and vitality, the foundational affective component of thriving. Three of those studies were conducted using student samples (Brdar & Kashdan, 2010; Taylor & Lonsdale, 2010; Vansteenkiste et al., 2006). Brdar and Kashdan (2010) found perceived relatedness to positively correlate with psychological vitality among their sample of 881 students ($r = .46, p < .001$). The other two studies (Taylor & Lonsdale, 2010; Vansteenkiste et al., 2006) employed regression
analyses and found perceived relatedness to significantly predict vitality in their samples of ungraduated students ($\beta = .35, p < .001$ and $\beta = .31, p < .01$, respectively). Four of the studies (Arabzadeh, 2017; Bernard, Martin, & Kulik, 2014; Kasser & Ryan, 1999; López-Walle, Balaguer, Castillo, & Tristán, 2012) utilized non-student samples. All of these studies reported significant, positive correlations between perceived relatedness and measures of psychological vitality with coefficients ranging from .31 to .58 ($ps < .01$).

As previously mentioned, Gucciardi and colleagues (2019) used a single index of basic psychological need satisfaction to examine the utility of need satisfaction in predicting student thriving using the conceptualization presented in the current study. Among their sample of 290 undergraduate students, basic psychological need satisfaction, which included the satisfaction of the need for relatedness, significantly predicted both vitality ($\beta = .52, p < .001$) and learning ($\beta = .44, p < .001$). The current study can expand on these findings by individually examining each of SDT’s basic psychological needs as predictors of student thriving.

**Relation with burnout.** Nine studies were located that quantified the relationship between perceived relatedness and burnout. One of those studies (Sulea et al., 2015) used a sample of 255 college students. Using regression analyses, Sulea and colleagues (2015) found perceived relatedness to negatively predict student burnout ($\beta = -.13, p < .05$).

Five studies were located that examined the relationship between perceived relatedness and burnout. In their sample of 87 adult workers, Gerber, Isoard-Gautheur, Schilling, Ludyga, Brand, and Colledge (2018) found perceived relatedness to negatively correlate with emotional exhaustion ($r = -.30, p < .001$). Perceived relatedness did not significantly correlate with cynicism in this study. Three studies (Bartholomew, Ntoumanis, Cuevas & Lonsdale, 2014; Cuevas, Sánchez-Oliva, Bartholomew, Ntoumanis, and García-Calvo, 2015; Gillet, Fouquereau,
Huyghebaert, & Colombat, 2015) used samples of workers and found lower perceived relatedness to significantly relate to burnout ($r = .53, p < .01; \beta = .31, p < .01$; and $\beta = .46, p < .001$, respectfully). Additionally, Harmon-Darrow and Xu (2018) conducted an investigation using a sample of 53 volunteer community mediators and found perceived relatedness to negatively predict burnout in their sample ($\beta = -.53, p < .001$).

Additionally, Pacewicz and colleagues (2019) conducted a meta-analysis examining the relationships between social constructs and athlete burnout. Results of this review suggested perceived relatedness negatively correlates with burnout among athletes ($r = -.37, 95\% CI = -.45, -.32, k = 6$).

**Basic Psychological Needs as Mediators**

The utility of SDT’s basic psychological needs in mediating the relationship between the within-person resilience variables and indicators of student well-being has been minimally examined. No studies were located examining the ability of contextually grounded measures of basic psychological need satisfaction to mediate the relationship between dispositional optimism or cognitive reappraisal and student thriving or burnout. Only one study (Desrumaux et al., 2015) was located examining the basic psychological needs as mediators of the relationship between well-being at work in a sample of 298 teachers. Mediation analyses showed that only perceived work competence emerged as a significant mediator of the relationship between optimism and well-being (Indirect Effect = .04; significant at 95\% CI).

**Summary**

SDT proposes that satisfaction of basic psychological needs (i.e., volitional autonomy, perceived competence, and perceived relatedness) facilitates engagement of self-determined action which results in a heightened state of well-being. The extant literature supports the
relationship between the basic psychological needs and the indicators of student well-being in the current study (i.e., thriving and burnout). However, examination of the relationship between within-person resilience factors (i.e., dispositional optimism and cognitive reappraisal) and the basic psychological needs is known to a lesser extent. Furthermore, although the relationship between resilience variables and well-being has been well-established, the role of the basic psychological needs in mediating this relationship has been sparsely explored. As such, the current study will examine the ability of the academically-grounded basic psychological satisfaction to mediate the relationship between within-person resilience variables and student well-being. In doing so, the present study will aim to extend the utility of SDT to understanding the role of within person variables in generating well-being and preventing ill-being among college students.

**Need for the Current Study**

Chapter 2 has described each variable to be included in the hypothesized model of student well-being and reviewed the literature expounding on the relationships among these variables, lending support to the proposed model. This chapter has also demonstrated that while both within-person resilience variables and the basic psychological needs predict the experience of well-being, the interaction between the within-person resilience variables and the basic psychological is understood to a lesser extent. As such, the current study seeks to examine a model in which the basic psychological needs fully mediate the relationship between within-person resilience and student well-being. In addition to this primary objective, the current study seeks to address other gaps in the literature including:
• Bridging the gap between the work literature and student literature in conceptualizing thriving so that findings regarding thriving at work can be examined and applied in student contexts.

• Examining a conceptual frame for understanding the manner in which resilience variables such as dispositional optimism and cognitive reappraisal can relate to well-being, which can have important implications for therapists seeking to fit students with tools for maximizing their potential during their college experience.

Extending the utility of SDT in describing the relationship between the environment and well-being to the conceptualization of relations between within-person variables and well-being.
CHAPTER 3. METHOD

Chapter 3 describes the methodological approach taken to conduct the present investigation. The research design, participants, measures, procedures, and hypotheses are presented. Chapter 4 will describe the results of the study.

Design

The current study employed a cross-sectional correlational design. The predictor variables were dispositional optimism, cognitive reappraisal, academic volitional autonomy, perceived academic competence, and perceived campus relatedness. The criterion variables were student thriving and student burnout. Academic volitional autonomy, perceived academic competence, and perceived campus relatedness served as the mediating variables in the hypothesized model. Figure 1 displays the predicted relationships between the included variables.

Participants

The target population for this study was currently enrolled college students. The sample included college students drawn from introductory-level psychology and communication studies programs at Iowa State University during the Fall 2020 semester. Participants were all at least 18 years of age or older when completing the study. The sample was collected using the Iowa State Sona system, an online research sign-up system used by the university for mass testing. The current study was offered through the Sona system as a way for students to fulfill their research participation requirement for the semester. The initial sample included 727 participants that met the inclusion criteria (e.g., at least 18 years old, currently enrolled in undergraduate courses student at Iowa State University). The survey took approximately 45 minutes or less. Participating students received one course credit for completing the survey as compensation for
their research participation. One credit was awarded to participating students in adherence with university guidelines stipulating surveys requiring 45 minutes or less to complete are worth one research credit.

Following the data cleaning procedure to be described in Chapter 4, the final sample utilized in the current study included 658 participants. All participants were unrolled in undergraduate courses at Iowa State University (i.e., Communication Studies 101, Psychological 101, Psychology 230, Psychology 280). Demographics for the current sample are displayed in Table 3. Participant ages ranged from 18 to 52 \((M = 19.27, SD = 2.04)\), 433 identified as female (65.8%), 223 identified at male (33.9%), 1 identified as neither male or female (0.2%) and 1 participant did not provide a gender identity (0.2%). Regarding ethnic racial identity, 537 (81.6%) identified as White/Caucasian, 36 identified as Hispanic or Latinx (5.5%), 33 identified as Asian, Asian American, or Pacific Islander (5.0%), 23 identified as Black/African American (3.5%), 16 identified as multiracial (2.4%), 1 identified as Native American (0.2%), 4 chose not to provide their racial identity (0.6%), and 8 identified with another ethnic racial identity (1.2%). For year in school, 300 identified as first-year students (45.6%), 196 identified as second-year students (29.8%), 79 were third-year students (12.0%), 78 were fourth-year students (11.9%), and 3 identified as graduate students (0.5%). Five-hundred and fifty participants (83.6%) had declared a major at the time of participation in the current study while 108 had not (16.4%).

The sample size required to capture medium effect at a power of .80 and \(p < .05\) using structural equation modeling (SEM) varies from 20 per observed variable (Mueller, 1997) to a minimum total sample of 200 (Chou & Bentler, 1995). Because there were 21 observed variables in the current study (7 latent variables x 3 parcels), a minimum sample size of 420 participants
was required to conduct the intended analyses. The present sample \((N = 658)\) was well above the sample size required to provide adequate statistical power.

**Measures**

**Demographics**

Participants were asked to provide basic demographic information for themselves including age, gender, race/ethnicity, year in school, self-reported grade point average (GPA), and academic major. The demographics questionnaire is shown in Appendix A.

**Dispositional Optimism**

Dispositional optimism was measured using the Life Orientation Test-Revised (LOT-R; Scheier, Carver, & Bridges, 1994). The LOT-R, widely considered the gold standard measure of dispositional optimism, was a 10-item measure assessing an individual’s tendency to be optimistic versus pessimistic. Four of the items were fillers and were not included in the final score and negatively worded items are reverse coded before scoring. Items utilized a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). After three negatively worded items were reverse scored, the scale was scored using the mean item response across the six scored items with high scores indicating the individual is more optimistic. An example item is “In uncertain times, I usually expect the best.” Among the 2,055 undergraduate students surveyed during its initial reliability study, the LOT-R displayed acceptable internal reliability \((\alpha = .78)\) along with sound internal reliability at 4 \((r = .68)\), 12 \((r = .60)\), 24 \((r = .56)\), and 28 \((r = .79)\) month intervals suggesting the measure is reliable and stable across time (Scheier, Carver, & Bridges, 1994). Scheier and colleagues (1994) also provided convergent validity evidence for the LOT-R by finding it to modestly correlate with related constructs in the expected directions (e.g., depression: \((r = -.27, p < .001)\), self-esteem: \(r = .54, p < .001\)) in their sample of college students.
Coefficient alpha for this scale in the present study was .82. The LOT-R is displayed in Appendix B.

**Cognitive Reappraisal**

Cognitive reappraisal was assessed using the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), a 10-item scale designed to capture respondents’ tendency to regulate their emotions in two ways: 1) cognitive reappraisal and 2) emotional suppression. Each item was answered using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Six of the ten items were totaled to determine the cognitive reappraisal score while the other four items are totaled to determine the emotional suppression score and were not analyzed in the current study. Consistent with administration guidelines, scoring was kept continuous and separate for both subscales (Gross & John, 2003). For the current study, only the six cognitive reappraisal items were used as only the extent to which respondents engaged in cognitive reappraisal was of interest. A sample item from the cognitive reappraisal subscale is “I control my emotions by changing the way I think about the situation I’m in.”

In their initial validation study, Gross and John (2003) found the internal consistency of the cognitive reappraisal subscale to be $\alpha = .79$ in their sample of 1,628 college undergraduate students. Further, convergent validity evidence for the cognitive reappraisal scale can be seen in its correlation with negative mood regulation ($r = .30, p < .05$), and rumination ($r = -.29, p < .05$). Additionally, Gross and John (2003) provided evidence for discriminate validity in samples of college students in reporting the ERQ did not significantly correlate with measures of cognitive ability (e.g., SAT verbal and SAT quantitative) or social desirability. The ERQ’s cognitive reappraisal subscale also weakly correlated with neuroticism ($r = -.20, p < .05$), extraversion ($r = .11, p < .05$), openness ($r = .15, p < .05$), agreeableness ($r = .14, p < .05$), and
conscientiousness ($r = .13, p < .05$), indicating cognitive reappraisal converged with but did not duplicate stable personality traits. Coefficient alpha for this scale in the present study was .85. The items for the cognitive reappraisal subscale of the ERQ are listed in Appendix C.

**Academic Psychological Need Satisfaction**

Students’ satisfaction of the need for academic volitional autonomy, perceived academic competence, and perceived campus relatedness was measured using the Basic Psychological Need Satisfaction Scale – General Measure (BPNS-G; Gagné, 2003). This measure captured the extent to which the three basic psychological needs posited by SDT were satisfied in the participants’ lives. It consisted of three subscales that independently measure each basic psychological need: volitional autonomy, perceived competence, and perceived relatedness. Because there existed no measure of basic psychological need satisfaction that pertains specifically to the academic environment, wording of the BPNS-G was altered to capture perceptions of need satisfaction in an academic context. For example, the item “I really like the people I interact with” was changed to “I really like the people I interact with on campus.”

The BPNS-G was comprised of 21 items utilizing a 7-point Likert scale ranging from 1 (not at all true) to 7 (very true). A mean score was calculated across all items within each subscale with higher scores indicating greater satisfaction of the psychological need reflected in the subscale. Across all three subscales, nine negatively worded items (three per subscale) were reverse scored before deriving the total. Gagné (2003) used a sample of 121 undergraduate students to provide initial reliability and validity information for the scale, obtaining an initial reliability indicator of $\alpha = .89$. Results also indicated all need satisfaction scales were correlated ($r$’s = .61-66, $ps < .001$) suggesting each scale is related but captures conceptually unique constructs (Gagné, 2003). Similarly, a recent study (Niemiec, Ryan, & Deci, 2009) using a
sample of 246 undergraduate seniors found the three subscales to correlated between .55 and .58 ($p < .01$). Items for the BPNS-G adapted for the current study are available in Appendix D.

**Academic volitional autonomy.** The volitional autonomy subscale of the BPNS-G included seven items measured on the previously mentioned 7-point Likert scale. High scores indicated greater perceived ability to make choices regarding one’s academic experience. An example item was “I generally feel free to express my ideas and opinions on campus.” Investigations have found the internal consistency of the volitional autonomy subscale to be sound among samples of college students ($\alpha = .69$ in Gagné, 2003; $\alpha = .73$ in Niemiec et al., 2009). Convergent validity estimates show that the volitional autonomy satisfaction subscale correlated strongly with perceived growth ($r = .62, p < .01$; Niemiec et al., 2009) and positive affect ($r = .19, p < .05$; Niemiec et al., 2009). Coefficient alpha for this scale in the present study was .62.

**Perceived academic competence.** The perceived competence subscale of the BPNS-G included six items rated on the 7-point Likert scale with higher scores indicative of greater perceptions of personal efficacy in managing one’s academic responsibilities. An example item was “I often do not feel very capable with my schoolwork.” The perceived competence subscale has demonstrated adequate internal reliability among samples comprised of undergraduate students ($\alpha = .71$ in Gagné, 2003; $\alpha = .73$ in Niemiec et al., 2009). Niemiec and colleagues (2009) found perceived competence as measured using the BPNS-G to positively correlate with perceived growth among college students ($r = .45, p < .01$) and negatively correlate with anxiety ($r = -.40, p < .01$) and negative affect ($r = -.39, p < .01$). Coefficient alpha for this scale in the present study was .73.
**Perceived campus relatedness.** The perceived relatedness subscale of the BPNS-G includes eight items utilizing the 7-point Likert scale. Higher scores on this scale indicated greater feelings of interpersonal connectedness within one’s academic environment. An example item was “People on campus are generally pretty friendly towards me.” Gagné, (2003) as well as Niemiec and colleagues (2009) have found the internal consistency for this scale to be acceptable when used among samples of college students (α = .86 and α = .83, respectively). Niemiec and colleagues (2009) found perceived relatedness measured using this scale to correlate with perceived growth ($r = .38$, $p < .01$), positive affect ($r = .46$, $p < .01$), and negative affect ($r = -.34$, $p < .01$) among college students. Coefficient alpha for this scale in the present study was .83.

**Student Thriving**

Student thriving was measured using the Thriving at Work Scale (TWS; Porath, Spreitzer, Gibson, & Garnett, 2012). The TWS is a 10-item measure comprised of two 5-item subscales, one measuring vitality and one measuring learning, which are the two required components of thriving under Spreitzer and colleagues’ (2005) conceptualization. Items utilized a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Because the current definition of thriving involves the simultaneous experience of vitality and learning, the TWS was scored as a composite of the learning subscale and the vitality subscale. As such, scoring involved the calculation of a mean score across all items. A higher mean score indicated the respondent was experiencing a higher level of student thriving. This scoring method was consistent with previous findings supporting a second order factor structure of thriving (Porath et al., 2012). In the initial validation study of the TWS, Porath and colleagues (2012) found the model positing vitality and learning as two first-order factors that load onto a second-order factor to fit the data significantly better than a single factor model ($\Delta \chi^2(1, N = 175) = 66.02, p = .001$).
when using a sample of 175 undergraduate students who were employed at least 25 hours per week. This model was an acceptable fit to the data by all indices ($\chi^2(34, N = 175) = 67.66, p = .001$, $\text{CFI} = .98$, $\text{RMSEA} = .09$, $\text{SRMR} = .06$, $\text{RFI} = .96$).

Because no measures of thriving using the current conceptualization in an academic context were located, wording of the TWS was altered to instruct respondents to respond to items according to their academic context rather than a work context. Specifically, the instructional stem for each item was changed to “At college…” instead of the original “At work.” For example, the item “At work, I feel alive and vital” was changed to “At college, I feel alive and vital.” Previous investigations (e.g., McIlveen, Beccaria, & Burton, 2013) have demonstrated consistency in measures across vocation and academic contexts suggesting measures can be adapted across these contexts. Further, Gucciardi and colleagues (2019) altered the TWS in a similar manner for use in an academic context and found the expected factor structure to be present. As such, minor alteration to the TWS to reflect student thriving was deemed appropriate.

The TWS has demonstrated acceptable internal consistency among both worker and college student samples when measuring thriving composite ($\alpha = .94$) and when each subscale was examined separately (learning: $\alpha = .83$; vitality: $\alpha = .79$; Gucciardi et al., 2019). Thriving composite will be assessed in the current study. In the initial validation study of the TWS (Porath et al., 2012), composite thriving scores have also demonstrated relationships of the expected magnitude and direction with related constructs such as burnout ($r = -.74, p < .001$) and general health ($r = .38, p < .01$), providing convergent validity evidence for the measure. Porath and colleagues (2012) also found TWS scores to significantly correlate with positive affect ($r = .45, p < .01$), negative affect ($r = -.32, p < .01$), and proactiveness ($r = .54, p < .01$) among young
adults. Coefficient alpha for this scale in the present study was .87. Items for the TWS are displayed in Appendix E.

**Student Burnout**

Student burnout was measured using the Maslach Burnout Inventory – Student Survey (MBI-SS; Schaufeli et al., 2002). Considered the gold-standard for measuring burnout among students, the MBI-SS consists of 15 items constituting three scales consistent with the three-factor conceptualization of burnout involving emotional exhaustion (EX; 5 items), cynicism (CY: 4 items), and reduced efficacy (rEF; 6 items). Item stems reflected student burnout experiences that participants responded to using a frequency rating on a 7-point Likert scale ranging from 0 (never) to 6 (always). Higher total scores on the EX and CY subscales reflected greater levels of emotional exhaustion and cynicism, respectfully. After the rEF items were reverse scored, total scores on this scale reflected greater reductions in personal efficacy. As previously mentioned, only the EX and CY subscales were used for the current study.

Schaufeli and colleagues (2002) used three multi-national samples of undergraduate students to examine the psychometrics of the MBI-SS among college students from three different nations. Both the EX and CY subscales demonstrated acceptable internal consistency estimates across all three samples (EX: α’s = .74 - .80; CY: α’s = .79 - .86). Schaufeli and colleagues (2002) also provided convergent validity evidence for the EX and CY subscales in showing to each subscale to correlate modestly with related but distinct constructs. For example, in one college student sample, emotional exhaustion was significantly correlated with measures of vigor \( (r = -.23, p < .001) \), dedication \( (r = -.17, p < .001) \), and absorption \( (r = -.12, p < .05) \). Cynicism was significantly correlated with these constructs in the expected direction (vigor: \( r = -.38, p < .001 \); dedication: \( r = -.61, p < .001 \); absorption: \( r = -.32, p < .001 \)). Magnitude and
direction of all correlations indicated these constructs are related but conceptually distinct (Porath et al., 2012). Coefficient alpha for this scale in the present study was .89. Copyright permitted sample items from the EX and CY subscales of the MBI-SS are available in Appendix F.

**Procedure**

Prior to dissemination of survey materials to students through the Sona system, study approval was obtained from the Iowa State University Institutional Review Board. Participants were recruited using the Department of Psychology’s online platform for managing student participation in research projects. Participating students received 1 research credit for completing the survey. Upon entering the survey in Qualtrics, students were presented with an electronic informed consent document (displayed in Appendix G) and required to indicate their consent electronically before being directed to the survey questions. After providing their consent to participate, students were directed by Qualtrics to the demographic questionnaire, followed by the Life Orientation Test - Revised, Emotion Regulation Questionnaire, Basic Psychological Need Satisfaction – General scale, Thriving at Work Scale, and Maslach Burnout Inventory – Student Survey, respectfully. After completing the survey, students were debriefed regarding the purpose of the study and thanked for their participation. Consistent with Sona guidelines for online surveys that require 45 minutes or less to complete, the researcher then assign 1 credit to each respondent for participation in Sona.

**Hypotheses**

The measures used to operationalize each construct in the current model are presented in Table 1 for clarity. Table 2 displays each hypothesized relationship described below.

The following hypotheses are proposed:
**Hypothesis 1.** The model displayed in Figure 1 posited the basic psychological needs as fully mediating the relationships between the within-person resilience variables (dispositional optimism and cognitive reappraisal) and the student well-being indicators (student thriving and student burnout) will be a good fit to the data.

**Hypothesis 2.** The direct paths from dispositional optimism and cognitive reappraisal will be significantly positively related to academic volitional autonomy, perceived academic competence, and perceived campus relatedness (paths 1-6).

**Hypothesis 3.** The direct paths from academic volitional autonomy, perceived academic competence, and relatedness will be significantly positively related to thriving and negatively related to burnout (paths 7 – 12).

**Hypothesis 4.** Volitional autonomy, perceived competence, and relatedness will fully mediate the relationships between the predictors, dispositional optimism and cognitive reappraisal, and the student well-being outcomes, thriving and burnout.

**Hypothesis 5.** An alternative model positing partial mediation presented in Figure 2 will not fit the data significantly better than the hypothesized model presented in Figure 1 positing full mediation.
CHAPTER 4. RESULTS

Data Cleaning

Quality Check

In total, 807 students responded to the survey (i.e., accessed the link in the Sona system and provided their consent to participate). Of those, 80 respondents were excluded because they did not respond to any items following the informed consent indicator, leaving an initial eligible sample of 727 participants. Each of these individuals were full-time students who were at least 18 years of age. Additionally, three attention check items were included among the 52 conceptual items and 51 participants failed at least one attention check. Each of these 51 participants was removed from further analyses leaving 676 participants.

Missing Data and Outliers

All conceptual items were then examined for excessive missing data. Each of the 52 conceptual items had a response rate of at least 94.6%. As such, none were selected for removal. Next, participants were screened for excessive missing values across the 52 conceptual items. The majority of participants (610 of 676) responded to every item. Among the remaining 66 cases who failed to respond to at least one conceptual item, participants who failed to complete 20% or more of the conceptual items were removed in accordance with the guidelines posited by Schlomer and colleagues (2010). Five cases meeting this criterion were identified and removed from analyses, leaving 671 participants.

Subsequently, mean scores were calculated for each of the seven conceptual scales. Mean scores for each conceptual scale were computed if at least 50% of the data were present. Z-scores were then calculated for each participant’s mean scale scores in order to identify univariate outliers using the cutoff of $z > 3.29$ or $z < -3.29$ posited by Tabachnick and Fidell (2001). Six
participants were identified as containing a univariate outlier on at least one conceptual scale and were removed from analyses. Multivariate outliers were identified through computation of Mahalanobis distance testing (Tabachnick & Fidell, 2001). Seven cases were identified as multivariate outliers and removed. After removing these 13 cases, the final sample contained 658 participants.

Rates of missing data for these 658 participants ranged from 0% to 15% (8 items) with a total of 10 participants with missing responses on more than 3 items. Patterns of missingness among participants were examined using Little’s (1988) missing completely at random (MCAR) test which indicated missing data points were not randomly distributed across participants’ mean scale scores ($\chi^2 [12, N = 658] = 30.73, p < .01$). In order to test for selection bias within the data, dummy variables were created to indicate whether participants had a valid or missing entry for each conceptual predictor. T-tests were then used to determine whether scores on the dependent variables significantly differed between participants with valid responses and those with missing responses. Using a Bonferroni correction to account for multiple analyses (Rupert, 2012), no significant differences were found. This suggested the data were still missing at random (MAR) and that maximum likelihood estimation (MLR) could be used to produce unbiased parameter estimates for cases with missing data (Schlomer, Bauman, & Card, 2010).

**Preliminary Analyses**

Means, standard deviations, and correlations amongst conceptual variables are presented in Table 4. When examining the correlation matrix, perceived academic competence strongly correlated positively with student thriving and academic volitional autonomy ($r = .64, .54$) and negatively with student burnout ($r = -.61$). Academic volitional autonomy strongly correlated positively with perceived campus relatedness and student thriving ($r = .58, .53$) and negatively
with student burnout ($r = .50$). Burnout was strongly negatively correlated with student thriving ($r = -.57$). With few exceptions the remaining correlations were moderately correlated.

Scores on all conceptual variables were examined for significant mean differences according to relevant demographic variables (i.e., age, gender identity, racial identity, and year in school). Analyses of variance including all conceptual variables were conducted for each demographic variable. Using a Bonferroni correction ($p = .001$) to account for multiple comparisons, nearly all of these analyses were nonsignificant. Additionally, correlations between conceptual variables were examined for significant differences between genders. Using a Bonferroni correction ($p = .001$), none of the correlations were significantly different between groups. As such, no demographic variables were included in the primary analyses. The only significant difference identified was that students identifying as first years endorsed a higher level of autonomy than students identifying as juniors ($F [4, 655] = 6.37, p < .0001$).

**Comparison to Other Samples**

The means and standard deviations for the conceptual scales of the sample were compared to other college student samples in which the constructs were examined. The means for volitional autonomy, perceived competence, and relatedness were within $\frac{1}{2}$ standard deviation of works using the BPNS-G subscales on similar samples of college students (Gagné, 2003; Niemiec et al., 2009). The mean for dispositional optimism was within $\frac{1}{2}$ standard deviation of Scheier and colleagues’ (1994) validation study of the LOT-R comprised of college students. Similarly, the mean cognitive reappraisal score for the current sample was within $\frac{1}{2}$ standard deviation of the mean obtained using a sample of undergraduate students (Andreotti et al., 2013). Further, the mean thriving score for the current sample was within $\frac{1}{2}$ standard deviation of studies using comparable samples of college students (Porath et al., 2011; Gucciardi
et al., 2019). Finally, the mean burnout score for the current sample was within ½ standard deviation of the mean obtained in a study (Sulea et al., 2015) measuring the construct using the current operationalization (i.e., the emotional exhaustion and cynicism subscales of the MBI-SS). Taken together, these comparisons suggest the current samples is consistent with similar studies of college students using the current conceptual variables.

The demographic characteristics of the current sample were also compared to the demographics of Iowa State University’s (ISU) larger student population. A chi-square analysis indicated this sample did not significantly differ from the ISU student population with regard to proportions of White, Black, Asian American/Pacific Islander, Latinx, Native American, and biracial students (p > .05). However, the total sample for the current study contained a significantly larger proportion of female-identified students (65.8%) and significantly fewer male-identified students (33.9%) than the student body at large (44% and 56%, respectively) as indicated by a chi-square analysis ($\chi^2 [1, N = 34,047] = 131.64, p < .001$). Also worthy of note, the student participant pool captured by the Sona system is made available primarily to students enrolled in courses taken early in their academic trajectory (e.g., first and second year). As such, the current study was comprised primarily of first year (45.6%) and second year (29.8%) undergraduates with third year (12.0%), fourth year (11.9%) and graduate students (0.5%) less represented. Overall, the present sample appears representative of a first- and second-year student sample gathered at large-Midwestern R1 institution.

**Primary Analyses**

**Structural Equation Modeling**

Structural equation modeling (SEM) was conducted using Mplus 7.4 (Muthén & Muthén, 2012) to examine the hypothesized relationships among the conceptual variables as well as the
hypothesized model for fit to the data. SEM was chosen as the primary analysis due to its ability to account for measurement error. It is also able to account for the marginal internal consistency of volitional autonomy and the high correlations among some of the conceptual variables (e.g., thriving and perceived competence). Because Kolmogorov-Smirnov tests of univariate normality for each conceptual variable indicated all seven of the conceptual variables violated the assumption of univariate normality ($p$s < .05), multivariate normality was not possible. As such, models were estimated using a Satorra-Bentler corrected $\chi^2$ statistic that is robust to non-normality (Satorra & Bentler, 2001). Furthermore, MLR was used to impute casewise parameters for missing values due to its robustness to non-normality among the data although overwhelmingly there was very little missing data. Goodness of fit for all models was assessed using the guidelines established by Hu and Bentler (1999): a comparative fit index (CFI) of .95 or greater, a root-mean-square error of approximation (RMSEA) of .06 or less, and a standardized root-mean-square residual (SRMR) of .08 or less.

Measurement model. For the initial measurement model, three parcels or sets of observed indicators were used to estimate the five latent exogenous variables (e.g., dispositional optimism, cognitive reappraisal, academic volitional autonomy, perceived academic competence, and perceived campus relatedness). The two validated subscales representing the respective subconstructs of student thriving (i.e., vitality and learning) and student burnout (i.e., emotional exhaustion and cynicism) were used to estimate these latent endogenous variables.

However, the fitting of this measurement model yielded a warning message indicating the presence of linear dependence involving the endogenous variables and precluded further use of this model. The author consulted with Wei, Larson, and Shelley in exploring multiple options for moving forward. The best option appeared to involve creating parcel indicators for student
thrive and student burnout rather than relying on the use of their subscales. Previous investigations (e.g., Paterson et al., 2014) have treated student thriving as a unitary factor in the measurement model when conducting SEM and observed a satisfactory fit to the data. Similarly, prior studies (e.g., de Beer & Bianchi, 2019) have taken a similar approach when investigating student burnout using SEM and determined the measurement model to best fit the data when burnout is treated as a first-order factor captured by items represent emotional exhaustion and cynicism.

Prior to parceling, exploratory factor analyses specifying one factor with the current sample for both student thriving and student burnout were conducted. For student thriving, the factor loadings ranged from .36 to .89 and captured 45.9% of the variance. Likewise, factor loadings for student burnout ranged from .57 to .77 and accounted for 54.0% of the variance. As such, it was a reasonable approach to proceed with parceling these two constructs as they could be viewed as single-factor homogenous constructs. As such, the decision was made to fit a revised measurement model in which all seven latent conceptual variables were estimated using three parcels.

Russell and colleagues (1998) suggest the use of parceling when conducting SEM because parcels help to address the nonnormality of individual items, reduce the number of model parameters, and decrease the likelihood that unique aspects of individual items might impact model outcomes. In accordance with the guidelines forwarded by Russell and colleagues (1998), parcels for the current study were created by conducting exploratory factor analyses (EFAs) for each variable using the maximum likelihood method and fitting to a one factor solution. Items with the highest factor loadings were parceled into pairs with lower loading items
and distributed across the three parcels resulting in an approximately equal average loading on each parcel.

After parcels were created, the measurement model was examined to assess how well the parcels represented the seven latent constructs. With the exception of the significant $\chi^2 (\chi^2 [168, N = 658] = 374.15, p < .01)$ which is sensitive to sample size (Bergh, 2015), fit indices suggested a good fit to the data, CFI = .97, RMSEA = .04, (90% CI = [.037, .049]), SRMR = .04. All parcels significantly loaded onto their respective latent constructs with standardized betas ranging from .61 to .92 at $p < .001$ (see Table 5). Furthermore, the correlations among the latent variables (listed in Table 6) were statistically significant and in the expected direction.

**Structural Model.** The first hypothesis asserted that the model positing that the basic psychological needs would fully mediate the relationships between both within-person resilience variables (dispositional optimism and cognitive reappraisal) and both well-being indicators (student thriving and student burnout) would be a good fit to the data. The hypothesized structural model shown in Figure 1 was evaluated under Hu and Bentler’s (1999)’s goodness-of-fit criteria. With the significant $\chi^2$ as the exception, results showed the structural model also yielded a good fit to the data by all metrics ($\chi^2 [172, N = 658] = 378.06, p < .01; \text{CFI} = .97, \text{RMSEA} = .04, [90\% \text{ CI} = (.037, .048)], \text{SRMR} = .04$). Figure 3 shows the structural model results in terms of standardized betas with significant relationships ($p < .05$) indicated by solid lines and non-significant parameters denoted by dashed lines. The hypothesized model explained 69% of the variance in thriving and 57% of the variance in burnout. Results also indicated the model accounted for 33%, 44%, and 21% of the variance in autonomy, competence, and relatedness, respectively. In short, Hypothesis 1 was supported.
The second hypothesis stated dispositional optimism and cognitive reappraisal would each be significantly, positively, and directly related to academic volitional autonomy, perceived academic competence, and perceived campus relatedness. As shown in Figure 3, results revealed dispositional optimism and cognitive reappraisal had significant, direct relationships with academic volitional autonomy, perceived academic competence, and perceived campus relatedness. These findings support the second hypothesis.

The third hypothesis was that perceived academic competence, perceived campus relatedness, and academic volitional autonomy would each have significant, positive direct relationships with student thriving and significant negative direct relations with student burnout. As shown by Figure 3, perceived academic competence and perceived campus relatedness each had significant, direct relationships with student thriving while the direct relationship between academic volitional autonomy and student thriving was not significant. Further, perceived academic competence had a significant direct relationship with student burnout, whereas academic volitional autonomy and perceived campus relatedness did not significantly relate to student burnout. As such, the third hypothesis was partially supported.

**Indirect effects.** The fourth hypothesis posited academic volitional autonomy, perceived academic competence, and perceived campus relatedness would fully mediate the relationships between the predictors, dispositional optimism and cognitive reappraisal, and the student well-being indicators, namely student thriving and student burnout. To test this hypothesis, bootstrap testing using 95% confidence intervals was used to assess the proposed mediation relationships. These tests were conducted on the hypothesized model proposing full mediation (see Figure 1). The bootstrapping procedure repeated computation of model indirect effects with 1,000 generated samples to produce parameter estimates for total and specific indirect effects across
each of these artificial samples. Indirect effects with a confidence interval that did not contain zero show that the indirect effect was significant at \( p < .05 \). Preacher and Hayes (2008) identified bootstrapping as the gold standard approach for examining mediation because it provides greater statistical power and is not affected by assumptions regarding multivariate normality.

Table 7 displays the magnitude and statistical significance of the model indirect effects derived using the bootstrapping analysis. Indirect effects are organized with the table such that the first three mean indirect effects are those of dispositional optimism on student thriving; the next three specific indirect effects are the indirect effects of dispositional optimism on student burnout; the next effects are the specific indirect relations between cognitive reappraisal and student thriving; the final three specific indirect effects are relations between cognitive reappraisal and student burnout. Significant indirect effects are denoted in Table 7 by the 95% bias-corrected confidence interval (BC CI) that do not include zero.

The significant indirect effects from dispositional optimism to student thriving showed perceived academic competence and perceived campus relatedness as full mediators (effects 1b and 1c). Only one significant indirect effect was revealed for dispositional optimism and student burnout. Specifically, perceived academic competence (effect 2b) served as a full mediator of the relationship. These results partially support the fourth hypothesis.

When examining indirect effects regarding cognitive reappraisal and student thriving, an identical pattern appeared. Perceived academic competence and perceived campus relatedness emerged as full mediators (effects 3b and 3c). Similarly, one significant indirect effect was revealed from cognitive reappraisal to student burnout. Perceived academic competence (effect 4b) served as the only mediator of this relationship. These findings also partially support the fourth hypothesis.
In short, the fourth hypothesis was partially supported in that perceived academic competence mediated the relationships between both within-person resilience variables (dispositional optimism and cognitive reappraisal) and both indicators of student well-being (student thriving and student burnout). Further, the fourth hypothesis was also partially supported by the finding that perceived campus relatedness fully mediated the relation between dispositional optimism and student thriving along with the relationship between cognitive reappraisal and student thriving. The fourth hypothesis was also supported by the goodness-of-fit to the data demonstrated by the hypothesized model proposing full mediation, as indicated by the fit indices discussed above. The absence of a significant indirect effect involving academic volitional autonomy did not support the fourth hypothesis.

The fifth hypothesis stated that an alternative model proposing partial mediation of the relations between the within-person resilience variables and the student well-being indicators would not fit the data significantly better than the hypothesized model positing full mediation of the relations between the resilience predictors and the student well-being outcomes through the basic psychological needs. To test this hypothesis, the alternative model (shown in Figure 2) which contained direct relationships between the predictors (dispositional optimism and cognitive reappraisal) and the outcome variables (student thriving and student burnout) was first examined for fit to the data. Next, a chi-square difference test was conducted using the Satorra-Bentler chi-square test statistic (Satorra & Bentler, 2010) to assess whether the hypothesized model fit the data significantly better than the alternative model.

The alternative model yielded an acceptable fit to the data by all indicators with the exception of the significant chi-square ($\chi^2 [168, N = 658] = 374.15, p < .01; \text{CFI} = .97, \text{RMSEA} = .04, [90\% \text{ CI} = (.037, .049)], \text{SRMR} = .04$). Figure 5 displays the standardized beta results for
the alternative model with statistically significant parameters ($p < .05$) denoted with a solid line and non-significant parameters indicated by dashed lines. This model, as shown in Figure 5, accounted for 69% of the variance in thriving and 59% of the variance in burnout. Further, the alternative model accounted for 34%, 45%, and 21% of the variance observed in autonomy, competence, and relatedness, respectively.

The chi-square difference test was not significant, indicating the hypothesized fully-mediated model fit the data equally as well as the alternative model in which direct effects between predictor and outcome variables were specified ($\Delta \chi^2 (4, N = 658) = 3.74, p = .44$). The null findings mean the hypothesized full mediation model with no direct paths from dispositional optimism and cognitive reappraisal to student thriving and student burnout did not fit the data significantly worse than the alternative model. This occurred because the four direct paths from each of the within-person resilience variables to both student well-being outcomes were null as shown by Figure 5. As such, the full mediation model is the more parsimonious model. These findings supported the fifth hypothesis.

**Supplementary Analyses**

**Multicollinearity of Psychological Needs**

Direct relations from academic volitional autonomy to student thriving and student burnout were hypothesized but the relations were null as shown in Figure 3. Given the large correlations between autonomy and both competence and relatedness ($r_s = .54$ and .58, respectively) observed in the present study, multicollinearity may have prevented detection of significant relationships between autonomy and both thriving and burnout.

To assess for multicollinearity, six iterations of the hypothesized structural model using six possible arrangements of the basic psychological needs as mediators were examined.
Specifically, three models were run containing each of the needs individually and three models were run containing each combination of two needs (i.e., autonomy & competence, autonomy & relatedness, and competence & relatedness). As shown in Table 9, fit indices for each model suggested each iteration was a worse fit to the data than the original hypothesized model as at least one fit indicator for each model was outside the acceptable cut-offs identified by Hu and Bentler (1999). All fit indices were within the cut offs for the hypothesized model.

To further examine for multicollinearity, an additional structural model was fit utilizing a single latent variable for academic psychological need satisfaction as the lone mediator (see Figure 5). Specifically, academic volitional autonomy, perceived academic competence, and perceived campus relatedness were used as the observed indicators for the latent construct of academic psychological need satisfaction. This approach took into account the high correlations amongst the three basic psychological needs and marginal internal consistency for academic volitional autonomy. The other variables in this model were identical to those in the hypothesized model and were indicated using the same parcels utilized in all other model runs.

Before testing the structural model, confirmatory factor analysis was conducted on the measurement model using MPlus 7.4 (Muthén & Muthén, 2012) to examine whether it exhibited acceptable fit to the data using Hu and Bentler’s (1999) goodness-of-fit criteria described above. With the exception of the significant $\chi^2 (\chi^2[80, N = 658] = 201.47, p < .01)$ which is sensitive to sample size (Bergh, 2015), fit indices suggested an acceptable fit to the data, CFI = .98, RMSEA = .05, (90% CI = [.040, .056]), SRMR = .04. All parcels significantly loaded onto their respective latent constructs with standardized betas ranging from .69 to .91 at $p < .001$. Notably, factor loadings for academic volitional autonomy, perceived academic competence, and perceived campus relatedness onto academic psychological need satisfaction were statistically
significant (.71, .77, and .69, respectively) highlighting the likelihood of multicollinearity among each subconstruct. Taken together, these findings indicated a valid measurement and supported its utility for the structural model.

The structural model was then analyzed and evaluated using Hu and Bentler’s (1999) goodness-of-fit-criteria. Model results indicated this structural model was also an acceptable fit to the data with the exception of the significant $\chi^2$ which was again expected due to sample size ($\chi^2 [84, N = 658] = 206.23, p < .01; \text{CFI} = .98, \text{RMSEA} = .05, (90\% \text{CI} = [.039, .055]), \text{SRMR} = .04$). As shown in Figure 5, both dispositional optimism and cognitive reappraisal had significant positive relations with the latent variable representing academic psychological needs satisfaction. Further, academic psychological need satisfaction had significant positive relationships with both student thriving and student burnout. This model accounted for 70% of the variance for student thriving and 7% of the variance for student burnout.

Table 10 presents the magnitude and statistical significance of the specific and total indirect effects using the aforementioned bootstrapping procedure. Psychological need satisfaction significantly mediated all four possible relations between both within-person resilience variables and both student well-being indicators. These results highlight the likelihood of multicollinearity between the individual psychological needs. They also suggest utility of a unidimensional index of need satisfaction in conceptualizing the mediation relations between both within-person resilience variables and each well-being indicator.
CHAPTER 5. DISCUSSION

The current study aimed to identify a theoretical framework for linking within-person variables to indicators of psychological well-being among college students, thereby highlighted potential mechanisms for nurturing student psychological health. Online survey data was collected from full-time students enrolled in courses at Iowa State University. Data cleaning procedures yielded a final sample of 658 students. Demographics comparisons with the larger student body indicated the current sample was representative of the broader student population. Comparisons with other student samples utilizing the current measures indicated the current sample provided mean scores on the conceptual scales that were consistent with other college students.

Hypothesis Testing

Student data collected during the present investigation was used to examine the utility of self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000) in conceptualizing the relationship between within the within-person resilience variables (dispositional optimism and cognitive reappraisal) and the two indicators of student well-being (thriving and burnout). Specifically, it was hypothesized that the basic psychological needs identified by SDT (academic volitional autonomy, perceived academic competence, and campus relatedness) would fully mediate this relationship as shown in Figure 1. This expectation was grounded in empirical literature indicating dispositional optimism and cognitive reappraisal should relate directly with each of the basic psychological needs and that the basic psychological needs should relate directly with thriving and burnout. The proposed model also drew on SDT’s premises that contextual factors contribute to basic psychological need satisfaction and that basic psychological need satisfaction facilitates well-being. Because a notable body of literature
suggests dispositional optimism and cognitive reappraisal also have direct relations with indicators of well-being, including thriving and burnout, the hypothesized model was tested against an alternative model (shown in Figure 2) that allowed for direct relations between both within-person resilience variables and thriving and burnout. The current study was the first to employ SDT as a frame for the relationships among these variables.

From the broadest perspective, results indicated SDT could be used as a valid conceptual frame for understanding thriving and burnout among students, supporting the utility of the basic psychological needs as full mediators. Findings represent an important step in establishing a model of student thriving that is relatively consistent with examinations of thriving in the work literature. Results in terms of specific hypotheses are discussed below. Table 2 contains a listing of each hypothesized relationship.

**Hypothesis 1**

It was expected that the hypothesized model depicted in Figure 1 positing full mediation of the relationships between both within-person student resilience variables and both student well-being indicators by the basic psychological needs would yield a good fit to the data. Using SEM and the criteria for goodness-of-fit identified by Hu and Bentler (1999), the hypothesized model was found to be a good fit to the data, thereby confirming Hypothesis 1.

This finding suggested SDT represents a useful conceptual tool for conceptualizing the effect of dispositional optimism and cognitive reappraisal on thriving in burnout. More broadly the current findings expand on the limit literature suggesting that the basic psychological needs may represent a mechanism by which within-person variables contribute to well-being among students. The usefulness of the current model is further emphasized by the finding that the relationships posited therein accounted for 69% of the variance in student thriving and 57% of
the variance in student burnout. Each value is considered a large effect size (Cohen, 1988). In examining Figure 3, it is important to note that academic volitional autonomy did not significantly relate to either student well-being outcome. Also, perceived campus relatedness did not significantly relate to student burnout in the model.

**Hypothesis 2**

It was hypothesized that dispositional optimism and cognitive reappraisal would each be significantly, positively, and directly related to academic volitional autonomy, perceived academic competence, and campus relatedness.

**Dispositional optimism.** As predicted, dispositional optimism displayed notable explanatory utility in that it showed significant, positive, and direct relationships with all three basic psychological needs. Specifically, students holding a more optimistic disposition were more likely to endorse feelings of academic volitional autonomy, perceived academic competence, and perceived campus relatedness within the context of their role as students. This finding expands on the limited number of studies investigating these relations among students and extends documentation of these relationships from more general adult samples to the student population using academically grounded constructs.

The relationship observed between dispositional optimism and academic volitional autonomy observed in the current study was consistent with the only two previous studies located that examined relations between dispositional optimism and constructs related to academic volitional autonomy (i.e., Dawson & Pooley, 2013; Ruthig et al., 2009). These studies demonstrated dispositional optimism to positively relate with students’ dispositional and volitional functioning (Dawson & Pooley, 2013) and perceived academic control among students (Ruthig et al., 2013). Similarly, the relationship between dispositional optimism and perceived
academic competence observed in the present study was consistent with the two previous studies identifying a positive relation between dispositional optimism and academic self-efficacy among college students (Vizoso-Gómez and Arias-Gundín, 2018; Vizoso et al., 2019). While no studies were located examining the relation between dispositional optimism and perceived campus relatedness among students, the current findings are consistent with the three studies examining the relation between dispositional optimism and general relatedness using adult samples (Desrumaux et al., 2015; Ionescu, 2017; Ionescu & Iacob, 2019). The current study added to this limited literature by identifying this relationship within the contextual frame of higher education as the first known study to document the relationship between dispositional optimism and perceived campus relatedness using a college student sample. The current results suggest that holding more positive expectations and anticipating more positive outcomes is associated with increased perceptions of being able to dictate one’s academic choices, increased feelings of effectiveness in managing academic tasks, and increased feelings of connectedness to others on campus.

**Cognitive reappraisal.** Further confirming the second hypothesis, cognitive reappraisal also had significant, positive, and direct relations with each of the three basic psychological needs. That is, student use of cognitive reappraisal as an emotion regulation strategy resulted in greater feelings of academic volitional autonomy, perceived academic competence, and campus relatedness. While the relationship between cognitive reappraisal usage and satisfaction of SDT’s basic psychological needs has been scarcely documented, the current study’s result is consistent with previous works highlighting linkages between cognitive reappraisal and student volitional autonomy (Fishman & Husman, 2017) and student self-efficacy (Seibert et al., 2017). The current study is the first to establish a direct relationship between cognitive reappraisal and
campus relatedness. However, the finding was not unexpected given cognitive reappraisal’s previously documented associations with factors that may contribute to feelings of relatedness such as the ability to maintain positive relations with peers (Balzarotti et al., 2016), self-perceived interpersonal flexibility (Xia et al., 2014), and sharing of emotions with peers (Gross & John, 2003). These findings highlight the potential of cognitive reappraisal as a technique for fostering psychological need satisfaction among college students. However, replication would further validate these findings given the limited exploration of the linkages between cognitive reappraisal and SDT.

**Effect size.** Underscoring the ability of dispositional optimism and cognitive reappraisal to predict the basic psychological needs, the current model accounted for 33%, 44%, and 21% of the variance in academic volitional autonomy, perceived academic competence, and perceived campus relatedness, respectively, each considered a large effect size (Cohen, 1988).

**Hypothesis 3**

It was hypothesized that perceived academic competence, campus relatedness, and academic volitional autonomy would each have significant, positive direct relationships with student thriving while having significant negative direct relations with burnout.

**Perceived academic competence.** As hypothesized, perceived academic competence demonstrated a significant positive direct relationship with student thriving and a significant negative direct relationship with student burnout. That is, an increase in students’ perceptions of their effectiveness in their academic tasks was directly associated with increases in students’ simultaneous experience of energy and personal growth. Further, an increase in students’ self-perceived academic effectiveness was also directly associated with decreased feelings of simultaneous emotional exhaustion and cynicism.
These findings are consistent with previous work as perceived competence among students has been shown to have direct relationships with constructs associated with the experience of thriving. While no studies were located examining the relation of perceived academic competence with student thriving, the current findings are consistent with previous work showing general self-efficacy among students was associated with student thriving (Bensemmane et al., 2018) and that perceived task-specific competence was associated with students’ experiences of task-specific thriving (Sheldon & Filak, 2008). Further, the current finding is consistent with previous work demonstrating perceived academic competence to predict vitality (the affective subcomponent of thriving) among college students (Taylor & Lonsdale, 2010).

The current results are also consistent with the extant work literature demonstrating perceived work competence as a significant predictor of thriving among employees in a variety of workplaces (e.g., Ren et al., 2015; Spreitzer & Porath, 2014; Zhu et al., 2019). Further validation of this relationship using a student sample and an academic context suggests the construct of thriving functions similarly in academic and workplace settings. As such, factors aimed at enhancing the experience of thriving at work may also inform efforts to increase thriving among college students.

The significant negative direct relationship between perceived academic competence and student burnout was also consistent with previous investigations observing perceived academic competence (Shih, 2015a; Sulea et al., 2015), general self-efficacy (Maricuțoiu & Sulea, 2019; Olwage & Mostert, 2014), and general problem-solving self-efficacy (Yang & Farn, 2005) to negatively relate with student burnout. It is important to note that reduced self-efficacy, a construct only semantically different than perceived competence, has historically been
considered to represent a required part of the burnout syndrome (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2001). However, more recent reviews (e.g., de Beer & Bianchi, 2019; Shaufeli & Taris, 2005) have suggested self-inefficacy does not represent part of the burnout experience but represents a potential antecedent or consequence. Findings from the current investigation are consistent with previous work demonstrating perceived competence significantly negatively relates to burnout conceptualized as syndrome of emotional exhaustion and cynicism.

Perceived campus relatedness. In partial support of the Hypothesis 3, perceived campus relatedness was significantly, positively, and directly related to student thriving. That is, feeling a sense of connection and belonging on campus was a positive predictor of feeling energetic and learning during one’s academic pursuits. While the current study was the first to explore the relationship between perceived campus relatedness and thriving among students, this current finding is consistent with prior studies in which perceived relatedness at work significantly, positively, and directly predicted thriving in samples of workers (e.g., Ren et al., 2015; Spreitzer & Porath, 2014). This finding also corroborates previous work indicating perceived campus relatedness among students positively explained positive affect directed toward one’s studies, a construct conceptually related to thriving (Sheldon & Filak, 2008).

However, the direct relation between perceived campus relatedness and student burnout was not significant which does not support Hypothesis 3. That is, feelings of connectedness with peers on campus was not significantly associated with reduced experience of emotional exhaustion and cynicism in the current sample of students. This contradicts previous work that identified perceived campus relatedness as significantly, negatively related to burnout among students (e.g., Sulea et al., 2015). The current finding was also inconsistent with previous studies
demonstrating relatedness at work to negatively relate with burnout among adult workers (i.e., Bartholomew et al., 2014; Cuevas et al., 2015; Gillet et al., 2015). However, two these studies (i.e., Bartholomew et al., 2014; Cuevas et al., 2015) included self-infficacy in their measure of burnout while the third (Gillet et al., 2015) conceptualized burnout as emotional exhaustion only. Relatedness amongst teammates had also been shown to negatively relate with burnout in a meta-analysis of relations between social constructs and burnout among athletes (Pacewicz et al., 2019). The null finding in the current study is also surprising given the moderate bivariate correlation ($r = -.37$) observed between the two constructs in the current sample.

While one previous study (i.e., Sulea et al., 2015) documented a significant relation between perceived campus relatedness and student burnout among college students, the present study was notably different in its approach. First, the present study utilized SEM as the primary analysis while Sulea and colleagues (2015) relied on hierarchical multiple regression, a less stringent statistical approach. Second, Sulea and colleagues (2015) used an alternative measure of work relatedness that was altered to reflect an academic context while the current measure altered a more global measure of relatedness to an academic context. Third, Sulea and colleagues (2015) used a sample of Romanian college students, thereby conducting their study within a different cultural context than the present investigation.

Although further clarification of these discrepant findings is necessary, it may be that perceived campus relatedness is not as salient of a predictor for burnout among American students as it is for other populations. The absence of this relation in the current study may be due to the individualistic nature of higher education. Specifically, student achievement is primarily contingent on students’ individual performance of academic requirements with the role of peer relations and cooperation being less central to their academic objectives. As such,
perceptions of interrelatedness with peers may represent less of a buffer to exhaustion than it might within a context wherein pursuit of achievement is more contingent on the performance of the collective such as the workplace or within athletics.

An alternative explanation for the lack of a significant relationship with student burnout in the hypothesized model was the possibility of multicollinearity with the other two basic psychological needs given the moderate to strong correlations among the three needs. While analyses of models with one or more of the needs removed were a poor fit to the data as shown in Table 9, examination of a structural model (depicted in Figure 5) using a single latent variable to represent overall academic psychological need satisfaction using each of the three needs as indicators was a good fit to the data and demonstrated significant direct relations with both student thriving and burnout. This finding, along with the significant factor loadings of the three need subscales onto the latent need satisfaction variable, supports the interpretation that multicollinearity may have hidden some of the relations between some individual needs and the student well-being indicators. This finding also suggests that need satisfaction as a whole is a significant predictor of both student thriving and student burnout. Further investigation of perceived campus relatedness as a mediator of the relations between within-person resilience variables and student well-being indicators is needed to clarify these findings.

**Academic volitional autonomy.** Inconsistent with the third hypothesis, academic volitional autonomy did not significantly relate to either student thriving or student burnout. While no studies had investigated the relations between academic volitional autonomy and student thriving, this finding was unexpected given that previous investigations utilizing college student samples showed perceived volitional autonomy was significantly positively related with vitality (i.e., Gucciardi et al., 2019; Núñez et al., 2015; Vansteenkiste, et al., 2006) and learning
(i.e., Yair, 2000), the two subcomponents of student thriving. The current finding also contradicted relations identified between volitional autonomy and thriving observed in samples of workers (i.e., Liu & Bern-Klug, 2013; Ren et al., 2015; Sia & Duari, 2018; Spreitzer & Porath, 2014).

Also, academic volitional autonomy did not significantly relate to student burnout as expected in Hypothesis 3. This finding was inconsistent with previous work identifying academic volitional autonomy as a significant negative predictor of emotional exhaustion (Shih, 2015a; Zimmerman et al., 2018), cynicism (Shih, 2015; Zimmerman et al., 2018), and burnout as a single scale (Mazurkiewicz et al., 2012; Sulea et al., 2015). These findings were also inconsistent with the SDT literature which has posited that general and domain-specific volitional autonomy is the strongest contributor of well-being indicators among the three basic psychological needs (Deci & Ryan, 1985; Ryan & Deci, 2000). However, it is again notable that none of the aforementioned studies utilized the current scale for assessing volitional autonomy within an academic context which demonstrated marginal scale reliability ($\alpha = .62$). It is plausible that a less contextualized operationalization of volitional autonomy would have resulted in a significant relationship with student thriving and student burnout.

While the relations between academic volitional autonomy and both student thriving and student burnout warrant further attention, the absence of these effects in the current study could be due to the lesser role of academic volitional autonomy in higher education. The evaluative nature of the student experience may position students to focus more on their ability to meet the requirements set by others rather than opportunities to dictate their own academic pursuits. As such, students may not find it inherently valuable to make their own choices within an environment constructed such that growth and progress are determined by seemingly objective
evaluation from professors and teaching assistants. As such, students may place more of a premium on their perceived ability to meet these evaluative requirements.

Another possible reason for the absence of these relationships involved multicollinearity between academic volitional autonomy, perceived academic competence, and perceived campus relatedness. The medium to high correlations between these constructs in this sample ($r_s = .47 - .58$) may have caused the paths from academic volitional autonomy to student thriving and burnout to be smaller than they might have been had academic volitional autonomy been the sole SDT variable included in the model. While the model containing academic volitional autonomy as the sole mediators was not a good fit to the data as listed in Table 9, the previously discussed finding that overall psychological need satisfaction had significant relations with both student thriving and student burnout supports the position that relations involving academic volitional autonomy may be hidden by multicollinearity. It is also important to note academic volitional autonomy demonstrated significant, large bivariate correlations with student thriving ($r = .53$) and student burnout ($r = -.50$) that were in the expected direction.

**Hypothesis 4**

It was hypothesized that academic volitional autonomy, perceived academic competence, and campus relatedness would fully mediate the relationships between the predictors, dispositional optimism and cognitive reappraisal, and the student well-being outcomes, student thriving and student burnout.

Results of the bootstrapping procedure listed in Table 7 indicated six of the twelve possible indirect effects were confirmed significant, partially confirming Hypothesis 4. Furthermore, results for the alternative model (shown in Figure 4) provided evidence that the mediation effects observed in the hypothesized model could be considered complete or full
mediation. Specifically, when parameters representing direct effects from dispositional optimism and cognitive reappraisal to student thriving and student burnout were added to create the alternative model, these direct effects were not significant. The absence of a direct effect after controlling for the indirect relations in the model suggests the present mediating effects of can be classified as “complete mediation” (Baron & Kenny, 1986). This finding lends support to the idea that SDT’s claim that the basic psychological needs fully mediate the relationships between contextual factors and well-being metrics can be extended to relations between within-person resilience variables and well-being indicators among students. Specific mediation findings for each basic psychological need are discussed below.

**Perceived academic competence.** Similar to the findings regarding direct paths involving the construct, perceived academic competence emerged as the only basic psychological need to mediate all four relations between the within-person resilience variables and both indicators of student well-being in the current investigation. In the current sample, perceived academic competence fully mediated the relationships between dispositional optimism and both student thriving and student burnout as well as the relationships between cognitive reappraisal and both thriving and burnout among students. This finding was consistent with Hypothesis 4 and unsurprising given that perceived competence was involved in the most prominent direct paths observed in the hypothesized model results. These results were consistent with the only prior investigation using a sample of college students to demonstrate students’ general self-efficacy to mediate the relationship between dispositional optimism and student well-being (Yu & Luo, 2018). Similarly, the current finding was also consistent with a study using a sample of teachers in which perceived competence significantly mediated the relationships between optimism and well-being and ill-being (Desrumaux et al., 2015). The
current study was the first to examine the mediating capabilities of perceived academic competence within the relations between cognitive reappraisal and indicators of student well-being. As such, the current study seems to provide early evidence using a student sample that resilience variables (i.e., dispositional optimism and cognitive reappraisal) are indirectly related to student thriving and burnout through perceived academic competence.

The findings that perceived academic competence significantly mediated all relations from dispositional optimism and cognitive reappraisal to student thriving and student burnout underscores the importance of students feeling competent within their academic roles. Because higher education consistently requires the assessment of student progress and abilities, resources that contribute to their view of themselves as having the ability to successfully navigate their environment may contribute to heightened experiences of well-being and reduced experiences of ill-being. As such, dispositional optimism and cognitive reappraisal may assist students in interpreting environmental feedback as indicating academic competence while defending them against feedback that might suggest a lack of academic competence, thereby increasing their experience of thriving and reducing feelings of burnout.

**Perceived campus relatedness.** Perceived campus relatedness fully mediated the relationship between dispositional optimism and student thriving. It also fully mediated the relationship between cognitive reappraisal and student thriving. The current study is the first to document the mediation of perceived campus relatedness within the relationship between optimism and thriving. However, this finding that is consistent with previous investigations of adult workers identifying a similar construct (i.e., perceived relatedness at work) as positively predicted by dispositional optimism (Desrumaux et al., 2015) and representing a positive predictor of thriving (Spreitzer & Porath, 2014). Similarly, cognitive reappraisal has been
documented as a positive predictor or constructs similar to relatedness among college students (e.g., Balzarotti et al., 2016; Gross & John, 2003). However, none of these studies examined perceived campus relatedness as a mediator, and the current study is the first to demonstrate it as a mediator between within-person resilience resources and student well-being indicators. As such, the current study served as the first preliminary evidence that the relations from dispositional optimism and cognitive reappraisal to student thriving are mediated by perceived relatedness among college students.

Perceived campus relatedness did not significantly mediate the relations from either within-person resilience predictor and student burnout as shown by Figure 3. While no studies were located examining the role of campus relatedness as mediator between within-person resources and burnout among students, this result resembled a result observed using a sample of teachers in which optimism did not have a significant indirect effect on well-being through perceived work relatedness (Desrumaux et al., 2015). Results suggest the lack of significance of these indirect effects stems from the absence of a direct effect of perceived relatedness on burnout. This finding contradicted previous work identifying the perceived campus relatedness as significant negative predictor of burnout among students (i.e., Sulea, et al., 2015). Further investigation is needed to clarify the mediating role of perceived campus relatedness within the relations between within-person resilience variables and burnout among students.

In addition to the previously acknowledged multicollinearity concerns, the null finding regarding perceived campus relatedness as a mediator between the resilience resources and student burnout may have been due to the individual evaluative nature of the modern college campus. As previously mentioned, evaluation of one’s performance represents a persistent aspect of college student life. Accordingly, the extent to which students perceive themselves as able to
meet requirements may be the primary determinant of academic exhaustion among students. Perceived connection with peers on campus may do little to alter the extent to which student feel capable of meeting academic requirements. As such, despite the ability of resilience variables to promote perceptions of closeness on campus, this perception of closeness would do little to quell exhaustion related to academic requirements.

**Academic volitional autonomy.** As shown in Table 7, no indirect effects involving academic volitional autonomy were significant in the current sample. This was not surprising given the absence of direct effects from academic volitional autonomy to either student thriving or student burnout. Although no studies were located demonstrating relations between academic volitional autonomy and student thriving, the current findings were inconsistent with the four studies demonstrating a positive relation between volitional autonomy at work and thriving among adult workers (i.e., Liu & Bern-Klug, 2013; Ren et al., 2015; Sia & Duari, 2018; Spreitzer & Porath, 2014). The current findings are also inconsistent with the located studies demonstrating academic volitional autonomy to positively related with vitality (i.e., Gucciardi et al., 2019; Núñez et al., 2015; Vansteenkiste et al., 2006) and learning (i.e., Yair, 2000), the two subcomponents comprising student thriving. The current findings were also inconsistent with previous work demonstrating academic volitional autonomy to negatively relate with student burnout (i.e., Mazurkiewicz et al., 2012; Ringrose et al., 2009; Shih, 2015b; Zimmerman et al., 2018).

While no studies were located examining academic volitional autonomy as a mediator of within-person resilience variables and well-being indicators among college students, the findings of the current investigation are inconsistent with SDT’s broader claim that general volitional
autonomy represents the basic psychological with the strongest ability to mediate relationships involving well-being (Deci & Ryan, 1985; Ryan & Deci, 2000).

The null finding regarding the utility of academic volitional autonomy in mediating the relationships between the within-person resilience variables and either student well-being indicator may be due to the nuanced experience of academic volitional autonomy. On a college campus, students find themselves in a variety of contexts likely to vary in the availability of academic volitional autonomy. For example, students may feel free to make day-to-day choices about their college education such as balancing social life and course work but perceive themselves as less able to make choices regarding their broader academic journey such as which courses to take within their major or when to take required courses only offered as certain times. While the measure of academic volitional autonomy used in the current study attempted to capture the broader college experience, it could be that academic volitional autonomy experienced in a more specified domain within academia would better relate with student thriving and burnout while offering a possible mechanism by which resilience resources could fosters student well-being.

As previously discussed, multicollinearity among the basic psychological needs represents a plausible explanation for the insignificance of indirect effects involving academic volitional autonomy as the mediator.

**Hypothesis 5**

It was expected that the alternative model positing partial mediation of the relations between the resilience predictors and the student well-being outcomes through the basic psychological needs would not yield a superior fit to the data when compared to the hypothesized model positing full mediation of these relations. Specifically, the alternative model
included four additional parameters representing direct relations between dispositional optimism and both student thriving and burnout as well as from cognitive reappraisal to both well-being indicators. These relations have garnered extensive support in the literature but few studies (i.e., Desrumaux et al., 2015; Yu & Luo, 2018) have investigated the possible mediating role of the basic psychological needs.

The Satorra-Bentler chi-square difference test (Satorra & Bentler, 2010) indicated the two models fit the data equally well which was inconsistent with Hypothesis 5. However, it is notable that the four additional paths added to create the alternative model were not significant as shown in Figure 4. This suggests the previously described direct relations did not improve model fit to a statistically significant degree. As such, the hypothesized model was the more parsimonious model. Furthermore, the proportion of variance in student thriving accounted for by alternative model (69%) was no different than the amount of variance captured by the hypothesized model (69%). Similarly, the proportion of variance in student thriving captured by the alternative model (59%) was similar to the variance accounted for by the hypothesized model (57%). Each indirect path that emerged as significant during analysis of the hypothesized model remained significant when examined using the alternative model as shown in Table 8. These findings are consistent with previous work observing the basic psychological need to mediate the relationship between within-person traits and indicators of well-being (e.g., Desrumaux et al., 2015; Yu & Luo, 2018) expanding on SDT’s framework positing the needs mediate relations between contextual factors and well-being (Deci & Ryan, 1985; Ryan & Deci, 2000).

**Need Satisfaction as a Single Mediator**

As previously noted, a supplementary analysis was conducted on a structural model positing a unitary construct of need satisfaction, namely academic psychological need
satisfaction, as a single full mediator of the relations between the within-person resilience variables and the student well-being indicators. SEM revealed both the underlying measurement model and the structural model were a good fit to the data by all of Hu and Bentler’s (1999) goodness-of-fit criteria. Both dispositional optimism and cognitive reappraisal were significantly related to academic psychological need satisfaction. These results add further support to the hypothesized relations by indicating dispositional optimism and cognitive reappraisal may increase the likelihood of basic need satisfaction among students. Furthermore, academic psychological need satisfaction had a significant positive relation with student thriving and a significant negative relation with student burnout. These findings are consistent with SDT’s broader conceptual claim that general need satisfaction results in increased well-being and decreased ill-being (Deci & Ryan, 1985; Ryan & Deci, 2000). These findings also support the possibility that multicollinearity may have hidden relations involving the individual needs (i.e., academic volitional autonomy and perceived campus relatedness) in the hypothesized model results.

As shown in Table 10, bootstrap analysis revealed all four indirect effects of both within-person resilience variables on each student well-being indicator through academic psychological need satisfaction were significant. These findings combined with the hypothesized model results highlight the utility of need satisfaction among students in explaining relations between the resilience resources (dispositional optimism and cognitive reappraisal) and well-being among students (student thriving and student burnout). These findings also suggest it may be empirically feasible to combine satisfaction of the three psychological needs into a single latent variable representing an index of need satisfaction. However, as presented above, the hypothesized model results suggested each need played a unique role in explaining these relations among students.
Conclusions and Implications

The current study was among the first to provide support for an SDT-based model of student well-being using within-person resilience variables as the primary predictors. Findings highlighted the utility of SDT’s basic psychological needs (primarily perceived academic competence and campus relatedness) in predicting thriving and burnout among college students and explaining relationships between within-person resilience variables (dispositional optimism and cognitive reappraisal) and student well-being indicators. Findings represent an important addition to the SDT literature due to the small number of studies exploring the ability of the basic psychological needs to mediate relations between within-person variables and student well-being. The observed relations were particularly relevant to service providers in higher education aiming to target and enhance factors that facilitate student thriving while reducing student burnout. The hypothesized model provided preliminary insight into a potential mechanism through which within-person resources among student can result in greater levels of well-being. Specifically, it may be that dispositional optimism and cognitive reappraisal enhance student thriving by rendering students’ needs for perceived academic competence and campus relatedness more likely to be satisfied. Further, dispositional optimism and cognitive reappraisal may facilitate reductions in student burnout by rendering students’ need for perceived academic competence more likely to be met. As such, the present study provided a conceptual frame for directing efforts to enhance students’ personal resources so as to increase their well-being.

Additionally, the current study extended the literature regarding the construct of thriving by identifying that the well-being indicator has relations with the basic psychological needs that are similar among both college student and working adults. Despite its utility among students, the majority of investigations into thriving have utilized samples of working adults in examining
whether volitional autonomy at work (i.e., Liu & Bern-Klug, 2013; Ren et al., 2015; Sia & Duari, 2018; Spreitzer & Porath, 2014), perceived work competence (i.e., Ren et al., 2015; Spreitzer & Porath, 2014; Zhu et al., 2019), and relatedness amongst colleagues (i.e., Ren et al., 2015; Spreitzer & Porath, 2014) contribute to thriving in the workplace. The current study built on this literature within an academic context by demonstrating two of the three needs, namely perceived academic competence and perceived campus relatedness, positively related to thriving among college students. These findings provided evidence that student thriving functions similarly to thriving among workers in that satisfaction of basic psychological needs may facilitate the experience in both populations.

In terms of the within-person resilience constructs, both dispositional optimism and cognitive reappraisal had direct relations with each basic psychological need and indirect relations with student thriving through perceived academic competence and campus relatedness and with student burnout through perceived academic competence. These findings suggest that efforts to enhance student thriving and decrease student burnout could prioritize working with students to develop an optimistic approach as well as the ability to regulate their emotions through cognitive reappraisal. Further, results suggest dispositional optimism and cognitive reappraisal may be most likely to result in student well-being if targeting perceived academic competence and campus relatedness. As such, interventionists within student support entities such as university counseling centers and academic success centers could work with students to develop these resilience tools by implementing strategies to enhance student anticipation of positive outcomes regarding their competence at a given task or their abilities to make connections on campus. Similarly, efforts to instill cognitive reappraisal abilities could focus on reappraising situations interpreted by students as reflecting a lack of competence or inability to
relate to peers. In this manner, interventionists could intentionally maximize the effect of each resilience variable on the basic psychological needs, thereby increasing the likelihood of need satisfaction which, as the current findings demonstrated, is positively associated with student thriving and negatively associated with student burnout.

Regarding the basic psychological needs, each need made a different contribution to the hypothesized model. Model results revealed perceived academic competence was a significant contributor to both student well-being outcomes. The role perceived academic competence in the hypothesized model results emphasize the importance of students’ view of themselves as able to navigate the demands of their academic environments. In an environment where students are consistently required to earn positive feedback that will have implications for their long-term goals, resources that enable students to view themselves as competent must be prioritized. The current study suggested dispositional optimism and cognitive reappraisal may represent two of those resources. Findings also demonstrated perceived campus relatedness was a significant contributor to student thriving only. This finding suggests connections with peers may facilitate well-being among students but may not shield them against academic exhaustion. Considering the findings involving perceived academic competence, students may place more value on holding a positive view of their abilities than on connections with peers due to the practical implications for their performance in college and the life consequences thereafter. Academic volitional autonomy did not significantly predict student thriving or burnout in the current sample. This may be due the nuanced and varying role of volitional autonomy in an academic setting as well as the power differential inherent on college campuses between students and the professors they seek to please. However, post hoc analyses indicated the null finding may have been attributed to multicollinearity between the basic psychological needs.
These results reinforce the notion that efforts attempting to increase thriving and decrease burnout among students should prioritize strategies that enhance students’ perceived academic competence. Results also indicate enhancing perceived campus relatedness may also increase thriving among students. This might involve university personnel implementing strengths-based approaches in communicating with students in order to assist students in identifying their areas of competence. It could also involve creating spaces or events on campus or within academic departments to promote relationship-building within the campus community. The non-significant relations between academic volitional autonomy may indicate that the ability to choose and direct one’s academic journey plays less of a role in heightening student well-being than the other two needs. University administrators operating under increasing budget constraints may use this finding to inform their prioritization of the need enhancement interventions. Additionally, further investigation of academic volitional autonomy is needed to clarify its relation to student thriving and burnout.

However, the supplementary finding that the unidimensional academic need satisfaction variable significantly mediated the relations between each of the within-person resilience variables and both student well-being indicators is also noteworthy. This finding suggests that satisfaction of any of the needs is associated in aggregate with increased student thriving and reduce student burnout. From this perspective, the targeting of specific needs for enhancement may be less important. This finding may also indicate intervening personnel have flexibility in crafting their strategies for promoting student well-being through the psychological needs. Given that both dispositional optimism and cognitive reappraisal have significant positive relations with all three basic needs individually (as shown in Figure 3) and in aggregate (as shown in Figure 5),
both within-person resilience variables represent viable targets for promoting academic psychological need satisfaction and ultimately student well-being.

The current study emphasized the possible role within-person resilience variables play in fostering psychological need satisfaction and well-being among students. As previously mentioned, each basic psychological need was significantly predicted by both dispositional optimism and cognitive reappraisal. Programming designed to improve need satisfaction among students may be enhanced by including elements attempting to provide students with these resources. Expecting more positive outcomes or reframing situations to be less distressing may render students’ basic psychological needs more likely to be met. Recent investigations have determined both dispositional optimism (Malouff & Schutte, 2016) and cognitive reappraisal (Engelmann & Bannert, 2019) are able to be increased in college students using targeted interventions. Student support personnel should design such interventions to encourage student implementation of these strategies in a manner that increases basic psychological need satisfaction and, in turn, student well-being.

**Limitations and Future Directions**

The current study was the first to investigate SDT as a conceptual frame for understanding the relationships between within-person resilience variables (e.g., dispositional optimism and cognitive reappraisal) and thriving and burnout among college students. As such, future investigations are needed to replicate the current findings and provide further validation to these findings. This is especially important given the scarcity of previous work examining the basic psychological needs as mediating between personal resources and well-being. Furthermore, several paths included in the hypothesized model had not been previously investigated using a sample of college students. Future investigations should attempt to replicate and extend these
findings among subgroupings of students. Additionally, the generalizability of current findings is also limited due to the current sample gather from a single, predominately white, large upper-midwestern university, further emphasizing the need for replication of the current effects in more diverse samples. Increasing both sample size and diversity would allow for more complex analyses probing for nuanced mediation and moderation relationships between the current conceptual variables.

Another limitation of the current study was the use of cross-sectional data within a correlational design. As such, the current data cannot be used to make causal claims regarding the effects observed in the current analyses. Further, the mediation posited in the current study may not be interpreted as representing statistically representing causal relations. However, the directionality of the mediation proposed in the hypothesized model is consistent with the wealth of SDT research identifying the basic psychological needs as causal mediators in a variety of settings (Deci & Ryan, 2000). Future investigation aiming to extend the current findings would be well-served to collect longitudinal readings of the current conceptual variables in order to monitor changes in the hypothesized model over time. Such an approach would move investigators closer to establishing the basic psychological needs as a causal mechanism in the ability of student resilience variables to enhance student thriving and reduce student burnout. Future researchers might also incorporate experimental designs in order to manipulate levels of dispositional optimism and cognitive reappraisal. Such a design might involve randomizing students to a control group and an intervention group in which the receive training on remaining optimistic and using cognitive reappraisal to manager their emotions. It would also be useful to include groups in which the interventions aim to increase dispositional optimism and cognitive reappraisal regarding psychological need satisfaction. Analyses could subsequently compare
groups for changes in dispositional optimism, cognitive reappraisal, the basic psychological needs, student thriving, and student burnout across timepoints and examine the connection between change scores and model variables.

The current study also included only two resilience variables, one future-oriented (dispositional optimism) and one past-oriented (cognitive reappraisal). In order to examine more fully the role of within-person resilience variables in fostering well-being through satisfaction of the basic psychological needs, future studies should examine other variables related to psychological resilience such as adaptability, risk-taking, low fear of failure, and perseverance. Researchers may prioritize variables targeting perceived academic competence and perceived campus relatedness as these two variables were implicated as particularly tied to student thriving and student burnout and the present model was only able to account for 47% and 21% of the variance in these variables, respectively.

Another limitation of the current study was the marginal internal consistency of the academic volitional autonomy measure. While this value is relatively consistent with previous works utilizing the measure (e.g., Gagné, 2003) and the statistically methodology employed in the current study removed error variance, it raises concerns regarding the stability of the current measure. As such, future studies should consider measuring volitional autonomy among students using a different measure such as the perceived choice subscale of the Self-Determination Scale (SDS; Sheldon, Ryan, & Reis, 1996). Alternatively, future studies could further explore the utility of a single latent variable capturing need satisfaction across all three needs identified as an acceptable construct in the current study. This approach would also render mute the interpretive obstacle of multicollinearity which was raised in the current study. However, the examining need satisfaction as a latent variable capturing satisfaction of all three needs would prevent
examination of the unique role of each individual need. Such an approach was not acceptable in the current study due to interest in the ability of each need to individually serve as mediators.

Finally, it is important to note the current data was collected entirely during the COVID19 pandemic. As such, the daily experience of each student participating in the study was vastly different than student life in a pre- or post-pandemic world. For example, the majority of classes, including all those contributing to the research participant pool from which the current participants were drawn, were held in a virtual format. Student were much less likely to engage with academic responsibilities and peers as they would have in years prior. As such, satisfaction of the basic psychological needs within the academic environment for these students may differ in both quantity and quality from their predecessors and successors. The evolving nature of the format of higher education will be an important component for future researchers to consider. Future examination of the hypothesized relationships should account for the daily experience of each student in some manner so as to better generalize findings as the student experience of the academic landscape continues to shift.
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doi:http://dx.doi.org.proxy.lib.iastate.edu/10.1348/014466607X238797


doi:https://doi.org/10.1177/1049732307312201


doi:http://dx.doi.org.proxy.lib.iastate.edu/10.1007/s11031-006-9041-x


doi:http://dx.doi.org.proxy.lib.iastate.edu/10.1177/0021886314540209


doi:http://dx.doi.org.proxy.lib.iastate.edu/10.1016/j.adolescence.2017.06.004


doi:http://dx.doi.org.proxy.lib.iastate.edu/10.1348/096317908X285633


doi:http://dx.doi.org.proxy.lib.iastate.edu/10.1016/j.chb.2004.03.001


doi:http://dx.doi.org.proxy.lib.iastate.edu/10.1080/02619768.2018.1448778
### Table 1.
*Measures used to operationalize all study constructs*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispositional Optimism</td>
<td>Life Orientation Test – Revised</td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>Emotion Regulation Questionnaire – Cognitive Reappraisal subscale</td>
</tr>
<tr>
<td>Perceived Competence</td>
<td>BPNS Scale – General Measure</td>
</tr>
<tr>
<td>Volitional Autonomy</td>
<td>BPNS Scale – General Measure</td>
</tr>
<tr>
<td>Perceived Relatedness</td>
<td>BPNS Scale – General Measure</td>
</tr>
<tr>
<td>Student Thriving</td>
<td>Thriving at Work Scale</td>
</tr>
<tr>
<td>Student Burnout</td>
<td>Maslach Burnout Inventory – Student Survey</td>
</tr>
</tbody>
</table>

*Note. BPNS = Basic Psychological Need Satisfaction*
<table>
<thead>
<tr>
<th>Variable(s)</th>
<th>Hypothesis</th>
<th>Direct Relation(s) to</th>
<th>Direction</th>
<th>Fully Mediates Relation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispositional Optimism</td>
<td>2</td>
<td>Academic Volitional Autonomy</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Dispositional Optimism</td>
<td>2</td>
<td>Perceived Academic Competence</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Dispositional Optimism</td>
<td>2</td>
<td>Perceived Campus Relatedness</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>2</td>
<td>Academic Volitional Autonomy</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>2</td>
<td>Perceived Academic Competence</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>2</td>
<td>Perceived Campus Relatedness</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Academic Volitional Autonomy</td>
<td>3</td>
<td>Student Thriving</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Perceived Academic Competence</td>
<td>3</td>
<td>Student Thriving</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Perceived Campus Relatedness</td>
<td>3</td>
<td>Student Thriving (pos)</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Academic Volitional Autonomy</td>
<td>3</td>
<td>Student Burnout (negative)</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Perceived Academic Competence</td>
<td>3</td>
<td>Student Burnout (negative)</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Perceived Campus Relatedness</td>
<td>3</td>
<td>Student Burnout (negative)</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Academic Volitional Autonomy</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Dispositional Optimism to Thriving</td>
</tr>
<tr>
<td>Perceived Academic Competence</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Dispositional Optimism to Thriving</td>
</tr>
<tr>
<td>Perceived Campus Relatedness</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Dispositional Optimism to Thriving</td>
</tr>
<tr>
<td>Academic Volitional Autonomy</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Dispositional Optimism to Burnout</td>
</tr>
<tr>
<td>Perceived Academic Competence</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Dispositional Optimism to Burnout</td>
</tr>
<tr>
<td>Perceived Campus Relatedness</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Dispositional Optimism to Burnout</td>
</tr>
</tbody>
</table>
Table 3.  
*Participant demographics* 

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>19.27</td>
<td>2.04</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>433</td>
<td>65.8</td>
</tr>
<tr>
<td>Male</td>
<td>223</td>
<td>33.9</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>I choose not to respond</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>537</td>
<td>81.6</td>
</tr>
<tr>
<td>Hispanic/Latinx</td>
<td>36</td>
<td>5.5</td>
</tr>
<tr>
<td>Asian American/Pacific Islander</td>
<td>33</td>
<td>5.0</td>
</tr>
<tr>
<td>Black/African American</td>
<td>23</td>
<td>3.5</td>
</tr>
<tr>
<td>Two or more races</td>
<td>16</td>
<td>2.4</td>
</tr>
<tr>
<td>Native American</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>I choose not to respond</td>
<td>4</td>
<td>0.6</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>1.2</td>
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<tr>
<td>Year in School</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>300</td>
<td>45.6</td>
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<tr>
<td>Second</td>
<td>196</td>
<td>29.8</td>
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<tr>
<td>Third</td>
<td>79</td>
<td>12.0</td>
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<tr>
<td>Fourth</td>
<td>78</td>
<td>11.9</td>
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<tr>
<td>Graduate Student</td>
<td>3</td>
<td>0.5</td>
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<tr>
<td>Have you declared a major?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>550</td>
<td>83.6</td>
</tr>
<tr>
<td>No</td>
<td>108</td>
<td>16.4</td>
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</tbody>
</table>
Table 4.  
*Means, standard deviations, alphas, and correlations of conceptual variables*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
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<tbody>
<tr>
<td>1. Dispositional Optimism</td>
<td>.82</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>2. Cognitive reappraisal</td>
<td>.35*</td>
<td>.85</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Academic Volitional Autonomy</td>
<td>.40*</td>
<td>.30*</td>
<td>.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceived Academic Competence</td>
<td>.49*</td>
<td>.35*</td>
<td>.54*</td>
<td>.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Perceived Campus Relatedness</td>
<td>.37*</td>
<td>.22*</td>
<td>.58*</td>
<td>.47*</td>
<td>.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Student Thriving</td>
<td>.45*</td>
<td>.33*</td>
<td>.53*</td>
<td>.64*</td>
<td>.55*</td>
<td>.87</td>
<td></td>
</tr>
<tr>
<td>7. Student Burnout</td>
<td>-.43*</td>
<td>-.26*</td>
<td>-.50*</td>
<td>-.61*</td>
<td>-.37*</td>
<td>-.57*</td>
<td>.89</td>
</tr>
</tbody>
</table>

**Mean**

| 3.24 | 4.82 | 4.76 | 4.96 | 5.19 | 5.31 | 3.80 |

**Standard Deviation**

| 0.77 | 1.04 | 0.80 | 0.92 | 1.00 | 0.94 | 1.19 |

*Note. N = 658. Cronbach’s alpha for each measure is displayed on the diagonal in italics. Dispositional Optimism is scored on a scale of 1 to 5. All other scales are scores on a scale of 1 to 7. High scores indicate a greater degree of the variable. *p < .001.*
Table 5.  
*Factor loadings for the measurement model*

<table>
<thead>
<tr>
<th>Measure and variable</th>
<th>Unstandardized factor loading</th>
<th>SE</th>
<th>Z</th>
<th>Standardized factor loading</th>
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</thead>
<tbody>
<tr>
<td><strong>Dispositional Optimism (α = .85)</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Parcel 1</td>
<td>0.68</td>
<td>.03</td>
<td>23.34</td>
<td>.80*</td>
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<tr>
<td>Parcel 2</td>
<td>0.76</td>
<td>.03</td>
<td>26.05</td>
<td>.85*</td>
</tr>
<tr>
<td>Parcel 3</td>
<td>0.67</td>
<td>.03</td>
<td>22.16</td>
<td>.76*</td>
</tr>
<tr>
<td><strong>Cognitive Reappraisal (α = .87)</strong></td>
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<td></td>
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<tr>
<td>Parcel 1</td>
<td>0.91</td>
<td>.04</td>
<td>22.33</td>
<td>.75*</td>
</tr>
<tr>
<td>Parcel 2</td>
<td>0.98</td>
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<tr>
<td>Parcel 3</td>
<td>1.03</td>
<td>.04</td>
<td>24.85</td>
<td>.87*</td>
</tr>
<tr>
<td><strong>Academic Volitional Autonomy (α = .66)</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Parcel 1</td>
<td>0.54</td>
<td>.04</td>
<td>14.53</td>
<td>.61*</td>
</tr>
<tr>
<td>Parcel 2</td>
<td>0.72</td>
<td>.05</td>
<td>14.85</td>
<td>.63*</td>
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<tr>
<td>Parcel 3</td>
<td>0.75</td>
<td>.04</td>
<td>17.19</td>
<td>.66*</td>
</tr>
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<td><strong>Perceived Academic Competence (α = .72)</strong></td>
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<tr>
<td>Parcel 1</td>
<td>0.76</td>
<td>.04</td>
<td>18.10</td>
<td>.65*</td>
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<tr>
<td>Parcel 2</td>
<td>0.71</td>
<td>.04</td>
<td>16.35</td>
<td>.63*</td>
</tr>
<tr>
<td>Parcel 3</td>
<td>0.85</td>
<td>.04</td>
<td>21.78</td>
<td>.74*</td>
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<tr>
<td><strong>Perceived Campus Relatedness (α = .80)</strong></td>
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<td></td>
</tr>
<tr>
<td>Parcel 1</td>
<td>0.97</td>
<td>.04</td>
<td>26.91</td>
<td>.91*</td>
</tr>
<tr>
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<td>0.70</td>
<td>.04</td>
<td>16.88</td>
<td>.69*</td>
</tr>
<tr>
<td>Parcel 3</td>
<td>1.09</td>
<td>.05</td>
<td>23.65</td>
<td>.73*</td>
</tr>
<tr>
<td><strong>Student Thriving (α = .89)</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Parcel 1</td>
<td>0.90</td>
<td>.03</td>
<td>27.91</td>
<td>.91*</td>
</tr>
<tr>
<td>Parcel 2</td>
<td>0.86</td>
<td>.03</td>
<td>25.53</td>
<td>.89*</td>
</tr>
<tr>
<td>Parcel 3</td>
<td>0.97</td>
<td>.04</td>
<td>25.24</td>
<td>.81*</td>
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<tr>
<td><strong>Student Burnout (α = .92)</strong></td>
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<tr>
<td>Parcel 1</td>
<td>1.11</td>
<td>.04</td>
<td>29.55</td>
<td>.88*</td>
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<td>Parcel 2</td>
<td>1.19</td>
<td>.04</td>
<td>33.57</td>
<td>.92*</td>
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<td>Parcel 3</td>
<td>1.12</td>
<td>.04</td>
<td>29.07</td>
<td>.87*</td>
</tr>
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</table>

*Note. N = 658. Alpha statistics are based on each variable’s three parcels.  
*p < .001.*
Table 6.
Correlations among latent variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>1. Dispositional Optimism</td>
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<td>.39*</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. Cognitive reappraisal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Academic Volitional Autonomy</td>
<td>.54*</td>
<td></td>
<td>.40*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceived Academic Competence</td>
<td>.64*</td>
<td>.45*</td>
<td></td>
<td>.80*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Perceived Campus Relatedness</td>
<td>.44*</td>
<td>.26*</td>
<td>.73*</td>
<td></td>
<td>.62*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Student Thriving</td>
<td>.52*</td>
<td>.36*</td>
<td>.69*</td>
<td>.81*</td>
<td>.64*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Student Burnout</td>
<td>-.48*</td>
<td>-.29*</td>
<td>-.64*</td>
<td>-.75*</td>
<td>-.43*</td>
<td>-.63*</td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 658. Dispositional Optimism is scored on a scale of 1 to 5. All other scales are scores on a scale of 1 to 7. Higher scores indicate a greater degree of the variable.
* p < .001.
### Table 7.
**Bootstrap analysis of indirect effects for the hypothesized model**

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Mediator variables</th>
<th>Dependent variable</th>
<th>$\beta$ and product</th>
<th>Mean Indirect Effect (b)$^a$</th>
<th>SE of Mean$^b$</th>
<th>95% BC CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1a. Dispositional Optimism $\rightarrow$ Academic Volitional Autonomy $\rightarrow$ Student Thriving</td>
<td></td>
<td></td>
<td>(.46) X (-.05) = -.02</td>
<td>-.03</td>
<td>.01</td>
<td>-.21, .13</td>
</tr>
<tr>
<td>1b. Dispositional Optimism $\rightarrow$ Perceived Academic Competence $\rightarrow$ Student Thriving</td>
<td></td>
<td></td>
<td>(.55) X (.69) = .38</td>
<td>.51</td>
<td>.09</td>
<td>.36, .70*</td>
</tr>
<tr>
<td>1c. Dispositional Optimism $\rightarrow$ Perceived Campus Relatedness $\rightarrow$ Student Thriving</td>
<td></td>
<td></td>
<td>(.40) X (.25) = .10</td>
<td>.13</td>
<td>.04</td>
<td>.06, .21*</td>
</tr>
<tr>
<td>2a. Dispositional Optimism $\rightarrow$ Academic Volitional Autonomy $\rightarrow$ Student Burnout</td>
<td></td>
<td></td>
<td>(.46) X (-.18) = -.08</td>
<td>-.14</td>
<td>.16</td>
<td>-.38, .12</td>
</tr>
<tr>
<td>2b. Dispositional Optimism $\rightarrow$ Perceived Academic Competence $\rightarrow$ Student Burnout</td>
<td></td>
<td></td>
<td>(.55) X (-.68) = -.37</td>
<td>-.61</td>
<td>.15</td>
<td>-.83, -.39*</td>
</tr>
<tr>
<td>2c. Dispositional Optimism $\rightarrow$ Perceived Campus Relatedness $\rightarrow$ Student Burnout</td>
<td></td>
<td></td>
<td>(.40) X (.12) = .07</td>
<td>.08</td>
<td>.06</td>
<td>-.02, .19</td>
</tr>
<tr>
<td>3a. Cognitive Reappraisal $\rightarrow$ Academic Volitional Autonomy $\rightarrow$ Student Thriving</td>
<td></td>
<td></td>
<td>(.21) X (-.05) = -.01</td>
<td>-.01</td>
<td>.03</td>
<td>-.07, .05</td>
</tr>
<tr>
<td>3b. Cognitive Reappraisal $\rightarrow$ Perceived Academic Competence $\rightarrow$ Student Thriving</td>
<td></td>
<td></td>
<td>(.21) X (.69) = .14</td>
<td>.15</td>
<td>.04</td>
<td>.08, .23*</td>
</tr>
<tr>
<td>3c. Cognitive Reappraisal $\rightarrow$ Perceived Campus Relatedness $\rightarrow$ Student Thriving</td>
<td></td>
<td></td>
<td>(.11) X (.25) = .03</td>
<td>.03</td>
<td>.02</td>
<td>.01, .07*</td>
</tr>
<tr>
<td>4a. Cognitive Reappraisal $\rightarrow$ Academic Volitional Autonomy $\rightarrow$ Student Burnout</td>
<td></td>
<td></td>
<td>(.21) X (-.18) = -.04</td>
<td>-.05</td>
<td>.06</td>
<td>-.13, .04</td>
</tr>
<tr>
<td>4b. Cognitive Reappraisal $\rightarrow$ Perceived Academic Competence $\rightarrow$ Student Burnout</td>
<td></td>
<td></td>
<td>(.21) X (-.68) = -.14</td>
<td>-.18</td>
<td>.05</td>
<td>-.29, -.11*</td>
</tr>
<tr>
<td>4c. Cognitive Reappraisal $\rightarrow$ Perceived Campus Relatedness $\rightarrow$ Student Burnout</td>
<td></td>
<td></td>
<td>(.11) X (.12) = .01</td>
<td>.02</td>
<td>.01</td>
<td>.001, .05</td>
</tr>
</tbody>
</table>

*Note. N = 658. BC CI = Bias-Corrected Confidence Interval. *These values are based on the unstandardized path coefficients. *95% Confidence interval does not include zero and therefore is significant at $p < .05$. 
Table 8.
**Bootstrap analysis of indirect effects for the alternative model**

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Mediator variables</th>
<th>Dependent variable</th>
<th>β and product</th>
<th>Mean Indirect Effect (b)*</th>
<th>SE of Mean*</th>
<th>95% BC CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. Dispositional Optimism → Academic Volitional Autonomy → Student Thriving</td>
<td>(.46) X (-.06) = -0.03</td>
<td>.03</td>
<td>.09</td>
<td>-0.23, .11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1b. Dispositional Optimism → Perceived Academic Competence → Student Thriving</td>
<td>(.55) X (.71) = .39</td>
<td>.51</td>
<td>.11</td>
<td>.36, .81*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1c. Dispositional Optimism → Perceived Campus Relatedness → Student Thriving</td>
<td>(.40) X (.25) = .10</td>
<td>.14</td>
<td>.04</td>
<td>.06, .23*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2a. Dispositional Optimism → Academic Volitional Autonomy → Student Burnout</td>
<td>(.46) X (-.20) = -.09</td>
<td>-.15</td>
<td>.12</td>
<td>-.37, .10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2b. Dispositional Optimism → Perceived Academic Competence → Student Burnout</td>
<td>(.55) X (-.70) = -.39</td>
<td>-.63</td>
<td>.14</td>
<td>-.94, -.41*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2c. Dispositional Optimism → Perceived Campus Relatedness → Student Burnout</td>
<td>(.40) X (.14) = .06</td>
<td>.09</td>
<td>.06</td>
<td>.00, .21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3a. Cognitive Reappraisal → Academic Volitional Autonomy → Student Thriving</td>
<td>(.22) X (-.06) = -.01</td>
<td>-.01</td>
<td>.03</td>
<td>-.09, .04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3b. Cognitive Reappraisal → Perceived Academic Competence → Student Thriving</td>
<td>(.23) X (.71) = .16</td>
<td>.16</td>
<td>.05</td>
<td>.09, .28*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3c. Cognitive Reappraisal → Perceived Campus Relatedness → Student Thriving</td>
<td>(.11) X (.25) = .03</td>
<td>.03</td>
<td>.02</td>
<td>.01, .07*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4a. Cognitive Reappraisal → Academic Volitional Autonomy → Student Burnout</td>
<td>(.22) X (-.20) = -.04</td>
<td>-.05</td>
<td>.04</td>
<td>-.15, .03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4b. Cognitive Reappraisal → Perceived Academic Competence → Student Burnout</td>
<td>(.23) X (-.70) = -.16</td>
<td>-.20</td>
<td>.06</td>
<td>-.36, -.11*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4c. Cognitive Reappraisal → Perceived Campus Relatedness → Student Burnout</td>
<td>(.11) X (.14) = .02</td>
<td>.02</td>
<td>.01</td>
<td>-.001, .06*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 658. BC CI = Bias-Corrected Confidence Interval. *These values are based on the unstandardized path coefficients. *95% Confidence interval does not include zero and therefore is significant at p < .05.
<table>
<thead>
<tr>
<th>Included Mediator Variables</th>
<th>$\chi^2$ (df)</th>
<th>Degrees of Freedom (df)</th>
<th>Root Mean Square Error of Approximation (RMSEA)</th>
<th>Comparative Fit Index (CFI)</th>
<th>Standardized Root Mean Square Residual (SRMR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Academic Volitional Autonomy</td>
<td>763.27*</td>
<td>178</td>
<td>.07</td>
<td>.91</td>
<td>.10</td>
</tr>
<tr>
<td>2. Perceived Academic Competence</td>
<td>580.51*</td>
<td>178</td>
<td>.06</td>
<td>.94</td>
<td>.09</td>
</tr>
<tr>
<td>3. Perceived Campus Relatedness</td>
<td>817.09*</td>
<td>178</td>
<td>.07</td>
<td>.91</td>
<td>.13</td>
</tr>
<tr>
<td>4. Academic Volitional Autonomy &amp; Perceived Campus Relatedness</td>
<td>639.43*</td>
<td>176</td>
<td>.06</td>
<td>.93</td>
<td>.08</td>
</tr>
<tr>
<td>5. Academic Volitional Autonomy &amp; Perceived Academic Competence</td>
<td>569.718*</td>
<td>176</td>
<td>.06</td>
<td>.94</td>
<td>.08</td>
</tr>
<tr>
<td>6. Perceived Academic Competence &amp; Perceived Campus Relatedness</td>
<td>618.66*</td>
<td>176</td>
<td>.06</td>
<td>.93</td>
<td>.08</td>
</tr>
</tbody>
</table>

*Note. N = 658 for each model. Hu & Bentler’s goodness-of-fit criteria: CFI ≥ .95 or greater, RMSEA ≤ .06, and SRMR ≤ .08

*p < .001
Table 10
Bootstrap analysis of indirect effects for need satisfaction model

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Mediator variables</th>
<th>Dependent variable</th>
<th>$\beta$ and product</th>
<th>Mean Indirect Effect ($b^a$)</th>
<th>SE of Mean$^a$</th>
<th>95% BC CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dispositional Optimism $\rightarrow$ Academic Psychological Need Satisfaction $\rightarrow$ Student Thriving</td>
<td>(.56) X (.84) = .47</td>
<td>.61</td>
<td>.06</td>
<td>.49, .74*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Dispositional Optimism $\rightarrow$ Academic Psychological Need Satisfaction $\rightarrow$ Student Burnout</td>
<td>(.56) X (-.27) = -.15</td>
<td>-.24</td>
<td>.05</td>
<td>-.35, -.16*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Cognitive Reappraisal $\rightarrow$ Academic Psychological Need Satisfaction $\rightarrow$ Student Thriving</td>
<td>(.21) X (.84) = .18</td>
<td>.17</td>
<td>.05</td>
<td>.10, .25*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Cognitive Reappraisal $\rightarrow$ Academic Psychological Need Satisfaction $\rightarrow$ Student Burnout</td>
<td>(.21) X (-.27) = -.06</td>
<td>-.07</td>
<td>.02</td>
<td>-.11, -.04*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $N = 658$. BC CI = Bias-Corrected Confidence Interval. $^a$These values are based on the unstandardized path coefficients. $^*$95% Confidence interval does not include zero and therefore is significant at $p < .05$. 

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Figure 1.
The hypothesized structural model
Figure 2.
The alternative structural model
Figure 3.
Hypothesized structural model results
Note. Dashed lines indicated non-significant paths.
* $p < .05$
** $p < .001$
Figure 4.
Alternative structural model results
Note. Dashed lines indicated non-significant paths.
* $p < .05$
** $p < .001$
Figure 5.
Results for structural model using psychological need satisfaction at the sole mediator
*p < .001
APPENDIX A. DEMOGRAPHICS QUESTIONNAIRE

Age: __________

Gender: Male  Female  Other

Ethnicity:  African American
Asian American/Pacific Islander
Caucasian/White
Hispanic or Latino/a
Native American
Other: _____________

Year in School:  Freshman  Sophomore  Junior  Senior  Other: _____________

Have you declared a major? ___yes ____ no
If yes, what is your Academic Major: ___________
If no, what major are you most strongly considering? ___________
What is your current undergraduate GPA ___________
**APPENDIX B. THE LIFE ORIENTATION TEST – REVISED (LOT-R)**
(Scheier, Carver, & Bridges, 1994)

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no “correct” or “incorrect” answers. Answer according to your own feelings, rather than how think “most people” would answer.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

1. In uncertain times, I usually expect the best.
2. It's easy for me to relax.
3. If something can go wrong for me, it will.
4. I'm always optimistic about my future.
5. I enjoy my friends a lot.
6. It's important for me to keep busy.
7. I hardly ever expect things to go my way.
8. I don't get upset too easily.
9. I rarely count on good things happening to me.
10. Overall, I expect more good things to happen to me than bad.
APPENDIX C. EMOTION REGULATION QUESTIONNAIRE (ERQ)
(Gross & John, 2003)

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

<table>
<thead>
<tr>
<th>Strongly Disagree (1)</th>
<th>Neutral (3)</th>
<th>Strongly Agree (7)</th>
</tr>
</thead>
</table>

1. When I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about.
2. I keep my emotions to myself.
3. When I want to feel less negative emotion (such as sadness or anger), I change what I’m thinking about.
4. When I am feeling positive emotions, I am careful not to express them.
5. When I’m faced with a stressful situation, I make myself think about it in a way that helps me stay calm.
6. I control my emotions by not expressing them.
7. When I want to feel more positive emotion, I change the way I’m thinking about the situation.
8. I control my emotions by changing the way I think about the situation I’m in.
9. When I am feeling negative emotions, I make sure not to express them.
10. When I want to feel less negative emotion, I change the way I’m thinking about the situation.
APPENDIX D. BASIC PSYCHOLOGICAL NEED SATISFACTION SCALE – GENERAL MEASURE  
(Gagné, 2003)

Please read each of the following items carefully, thinking about how it relates to your college experience, and then indicate how true it is for you.

<table>
<thead>
<tr>
<th>Not at all true</th>
<th>Somewhat true</th>
<th>Very true</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. I feel like I am free to make my own decisions about my college education.
2. I really like the people I interact with on campus.
3. Often, I do not feel very competent with my schoolwork.
4. I feel pressured in my college education.
5. People I know tell me I am a good student.
6. I get along with people I come into contact with on campus.
7. I pretty much keep to myself and don't have a lot of social contacts on campus.
8. I generally feel free to express my ideas and opinions on campus.
9. I consider the people I regularly interact with on campus to be my friends.
10. I have been able to learn interesting new skills recently in my courses.
11. In my daily college experience, I frequently have to do what I am told.
12. People on campus care about me.
13. Most days I feel a sense of accomplishment from my schoolwork.
14. People I interact with on a daily basis on campus tend to take my feelings into consideration.
15. In my courses I do not get much of a chance to show how capable I am.
16. There are not many people that I am close to on campus.
17. I feel like I can pretty much be myself in daily situations on campus.
18. The people I interact with regularly on campus do not seem to like me much.
19. I often do not feel very capable with my schoolwork.
20. There is not much opportunity for me to decide for myself how to do things in my courses.
21. People on campus are generally pretty friendly towards me.
APPENDIX E. THRIVING AT WORK SCALE (TWS)  
(Porath, Spreitzer, Gibson, & Garnett, 2012)

Please use the following scale to rate how much you agree with each statement below.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. At college, I find myself learning often.  
2. At college, I continue to learn more as time goes by.  
3. At college, I see myself continually improving.  
4. At college, I am not learning.  
5. At college, I am developing a lot as a person.  
6. At college, I feel alive and vital.  
7. At college, I have energy and spirit.  
8. At college, I do not feel very energetic.  
9. At college, I feel alert and awake.  
10. At college, I am looking forward to each new day.
APPENDIX F. MASLACH BURNOUT INVENTORY – STUDENT SURVEY (MBI-SS)
(Schaufeli, Martínez, Marques Pinto, Salanova, & Bakker, 2002)
Emotional Exhaustion and Cynicism Items

Please use the scale below to rate how often you have the experiences described in each of the statements below.

<table>
<thead>
<tr>
<th>Never</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Always</th>
</tr>
</thead>
</table>

1. I feel emotionally drained by my studies.
2. I doubt the significance of my studies.
APPENDIX G. INFORMED CONSENT

Title of Study: Student Factors that Influence Thriving and Burnout at College
Investigators: Kent Crick, Principal Investigator
Lisa Larson, Ph.D., Study Supervisor

This is a research study. Please take your time in deciding if you would like to participate.

INTRODUCTION: The purpose of this study is to learn more about factors influencing undergraduate students’ perceptions of thriving and burnout at school.

DESCRIPTION OF PROCEDURES: If you agree to participate, you will be asked to complete several surveys. First you will be asked to fill out some demographic information, you will then be asked to answer questions relating to your emotional and cognitive experiences during your time in college. The whole survey will take about 20 minutes to complete. You will not be able to save your responses and finish at another time. If you intend to complete the survey you must finish it within a few hours of opening the survey.

RISKS: There are no foreseeable risks to participating in this survey. However, if you should feel uncomfortable or have concerns regarding the survey, please contact the primary investigator, Kent Crick, (email: kacrick@iastate.edu) or the study supervisor, Lisa Larson, Ph.D. (email: lmlarson@iastate.edu).

BENEFITS: If you decide to participate in this study there may be no direct benefit to you. It is hoped that the information gained in this study will contribute to the understanding of factors contributing to academic major satisfaction in college students.

COSTS AND COMPENSATION: You will not have any costs from participating in this study. You will receive one (1) research credit for participating. There are alternatives to completing this particular study if you wish to receive research credit such as participating in other studies, writing a research paper, etc. Please consult with your course instructor to learn about the difference ways you can earn research credit.

PARTICIPANT RIGHTS: Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide to not participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled. You can skip any questions that you do not wish to answer.

CONFIDENTIALITY: Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies, auditing departments of Iowa State University, and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.
To ensure confidentiality to the extent permitted by law, the following measures will be taken: - Once your survey responses are uploaded to our secure data file, your name will be replaced with an ID code. - All data will be kept on a password-protected desktop computer within a locked room. - If the results are published, your identity will remain confidential.

**QUESTIONS OR PROBLEMS:** You are encouraged to contact the principal investigator with questions at any time during this survey.

- For further information about the study, contact the primary investigator, Kent Crick (email: kacrick@iastate.edu) or the lab supervisor, Lisa Larson, Ph.D. (email: lmlarson@iastate.edu).
- If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

*****************************************************************************

**PARTICIPANT CONSENT:** By clicking the icon next to “I understand this information” you are indicating that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document, and that your questions have been satisfactorily answered. After clicking “Consent” you will be led to a page with the study information and your consent information.

I understand this information.