The Role of Psychological Flexibility in Graduate Student Stress and Well-Being

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THE ROLE OF PSYCHOLOGICAL FLEXIBILITY IN GRADUATE STUDENT STRESS AND WELL-BEING

A Dissertation

Presented to
the Faculty of the Morgridge College of Education
University of Denver

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

by
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Abstract

Despite the prevalence of mental health concerns among graduate students (Evans, Bira, Gastelum, Weiss, & Vanderford, 2018), research on graduate student mental health lags behind that of undergraduates (Hyun, Quinn, Madon, & Lustig, 2006). This study utilized Lent’s (2004) social-cognitive model of well-being to examine factors thought to contribute to graduate student well-being in a sample (N = 301) of graduate students in the United States. In particular, the role of the construct of psychological flexibility was examined for its influence on other factors in the model. Results indicated that the model demonstrated a good fit to the data while the hypothesized relationships in the model were partially supported. Positive affect predicted academic self-efficacy, academic satisfaction, and life satisfaction. Psychological flexibility predicted the advisory working relationship, academic self-efficacy, academic stress, and life satisfaction, but not academic satisfaction. The advisory relationship predicted academic stress and academic satisfaction, while academic self-efficacy predicted academic outcome expectations and goal progress. Academic outcome expectations also predicted academic satisfaction. Academic stress predicted academic satisfaction, and academic satisfaction predicted life satisfaction. The structural model accounted for 51% of the variance in academic stress, 59% of the variance in academic satisfaction, and 53% of the variance in life satisfaction. Comparison with an alternative model indicated that the hypothesized model including psychological flexibility provided a better fit to the data.
and explained more variance than a model without psychological flexibility. Moderation analyses suggested that psychological flexibility did not moderate the influence of academic stress on either academic satisfaction or life satisfaction. This study provides initial support for the utility of the well-being model in understanding factors contributing to graduate student mental health, while highlighting the role that psychological flexibility, positive affect, the advisory working relationship, and outcome expectations may have in promoting satisfaction outcomes for graduate students. Implications for promotion of graduate student well-being are discussed, as well as limitations of the current study and directions for future research.
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Chapter One

Introduction

Attending graduate school is associated with high levels of stress that can impact well-being and contribute to mental health problems (American College Health Association [ACHA], 2017; Hyun, Quinn, Madon, & Lustig, 2006). Compared to undergraduates, graduate students face more intense academic pressure, financial concerns, career uncertainty, and increased family and relationship responsibilities (University of California Student Mental Health Committee, 2006). Academic consequences of stress among graduate students include interference with academic work, longer time to graduation, and attrition from academic programs (ACHA, 2017; Gardner, 2008). Mental health consequences of graduate student stress range from subclinical distress, to diagnosed mental disorders, to suicide (ACHA, 2017; Brownson, Drum, Becker, Saathoff, & Hentschel, 2016; Hyun et al., 2006).

From an institutional perspective, graduate programs invest significant personal and financial resources into the success of their students, and rely on them as critical components of their teaching and research missions. When stress and mental health problems lead to lowered productivity and attrition among students, graduate programs are hampered as well (Lovitts & Nelson, 2000).

Research on graduate student mental health continues to lag behind research with undergraduates (Gardner, 2009; Hyun et al., 2006). In recent years articles in the popular
press have begun to bring more attention to the issue of stress and mental health in
graduate school (e.g. Anonymous, 2014; Arnold, 2014; Jaschik, 2015; Turley, 2013). At
the same time, enrollment in graduate programs has steadily increased since 2000,
growing 39% by 2017, and projected to increase another 3% by 2028 (National Center
for Education Statistics [NCES], 2019). This trend is likely to continue as individuals
holding graduate degrees are the least likely to be affected by economic downturns
(Bureau of Labor Statistics [BLS], 2017), and those with graduate degrees have seen
wages increase while wages have remained stagnant for bachelor’s degree holders
(Valletta, 2015). By 2024, the Bureau of Labor Statistics predicts that the jobs with the
highest growth rates will be those that require at least a master’s degree (Richards &
Terkanian, 2013).

These findings and trends suggest that it is becoming more important than ever to
understand the mental health of graduate students. From the perspective of the individual,
more people are being exposed to the stresses of graduate education. From the
perspective of institutions, policymakers, and society in general, more resources are being
directed towards the education of those who will be performing critical roles within
society. Thus it is in everyone’s interest to maximize the success of current and future
graduate students.

Studies have found that approximately 47% of doctoral students and 37% of
master’s degree students meet criteria for depression (University of California – Berkeley
Graduate Assembly [Graduate Assembly], 2014), and 40% report that academic demands
were “traumatic or very hard to handle” (ACHA, 2017). While these statistics are
concerning, this also suggests that over half of graduate students in these studies do not
meet criteria for depression or find their studies too difficult to handle. This suggests that there are dynamic factors that protect against the stressors of graduate school.

In contrast to the “mental health crisis” in graduate education (Jaschik, 2015), there also appear to be those who cope well with the stressors, and even thrive within the graduate school environment (Petridis, 2015; Hudyma & Mossman, 2014). Unfortunately, research on factors that contribute to graduate student well-being is even more limited than research that identifies sources of stress and dysfunction (Graduate Assembly, 2014).

It is unlikely that the structure and demands of graduate education will change in a way that reduces existing stressors. Given this reality, it may be useful to have a better understanding of the personal and contextual factors that give rise to graduate student well-being even in the face of these stressors. In addition, there is a lack of research on interventions that are effective with the particular constellation of stressors that graduate students face. A better understanding could allow students, counseling centers, and institutions to cultivate these factors and enact effective interventions. The current study sought to identify promising factors that encourage graduate student well-being, and to employ an integrative theoretical model to test relevant hypotheses.

**Stress and Well-Being**

**Stress.** In the context of this study, stress refers to the psychological response that occurs when an individual perceives that the demands placed on them challenge their capabilities and threaten their well-being (Lazarus & Folkman, 1984). The consequences of experiencing stress include anxiety, depression, worry, irritability, anger, sleep
disturbances, unhealthy eating behavior, and relationship difficulties (American Psychological Association [APA], 2016).

The National College Health Assessment for 2016 found that 20% of graduate students endorsed stress and nearly 17% endorsed anxiety as interfering with their academic performance. 45% reported experiencing “more than average stress,” while 13% reported experiencing “tremendous stress” (ACHA, 2016). A survey of graduate students at the University of California – Berkeley found that nearly 45% experienced a “stress-related problem” over the past year that affected their emotional well-being or academic performance (Hyun et al., 2006).

This study focused on the effect that academic stress has on graduate students. Academic stress refers to the perceived demands that students experience due to the environments and responsibilities of their educational program.

**Well-being.** Well-being, as studied by psychologists, refers to positive experience and functioning (Ryan & Deci, 2001). The study of well-being arose among researchers who thought that the discipline of psychology was too focused on distress and dysfunction (Diener, 1984). These researchers wanted to expand our knowledge of the positive aspects of human life, and articulate a conception of mental health that went beyond the absence of disease (Ryff & Singer, 1998).

The field of well-being is broad and there are multiple perspectives about what constitutes well-being, what causes well-being, and what the consequences of well-being are. There are two main “traditions” in well-being research. The hedonic tradition views well-being as being determined one’s relative experience of positive and negative affect, along with cognitive judgments about one’s satisfaction with life. The eudaimonic
tradition views well-being as living up to one’s potential, or self-realization. What unites these perspectives is an acknowledgement that they represent a scientific approach to the ancient philosophical concern with happiness and “the good life” (Ryan & Deci, 2001).

A finding that applies across well-being perspectives is that emotionally unpleasant experiences (e.g. stress, bereavement) are typically associated with reductions in well-being. However, in the proper context, difficult experiences can lead to long-term increases in well-being. Examples include posttraumatic growth and striving for important life goals (Diener, Oishi, & Lucas, 2003; Ryff, 2014).

The experience of graduate school can be viewed in light of these findings. For some students, the stress of academic demands leads to reduced well-being through mental health issues and maladaptive coping strategies. Those who have difficulty or even withdraw from graduate school often perceive the experience as a personal failing (Lovitts & Nelson, 2000). Other students experience the same stressors, but they ultimately find the experience meaningful and a source of pride.

**Robert Lent’s normative model of well-being**

There are those that have advocated for integrated accounts of well-being that go beyond the hedonic/eudaimonic divide (Kashdan, Biswas-Diener, & King, 2008). Multiple studies have demonstrated close associations between eudaimonic concepts and hedonic concepts, and factor analyses have cast doubt on the validity of separating key constructs (e.g. Disabato, Goodman, Kashdan, Short, & Jarden, 2015).

Counseling psychologist Robert Lent put forth an integrated model (2004) that combines hedonic and eudaimonic well-being factors in a framework informed by social cognitive theory (Bandura, 1986). Lent argued that counseling psychology had been
losing its historical focus on client strengths and fostering development across the lifespan, and was converging with clinical psychology by becoming more focused on the identification and treatment of dysfunction. Lent developed the model to encourage a return to counseling psychology’s historical concern with wellness. He also noted that the body of well-being research was mostly a theoretical enterprise, with little in the way of practical interventions that could be utilized by practicing psychologists. Thus the model was constructed to synthesize existing research on well-being with constructs that would be amenable to intervention.

A useful feature of this model is that it allows for flexibility with incorporating variables that are relevant to particular life domains, while preserving a theoretically-based causal and relational structure among the factors. Studies using the model typically use a combination of variables that are applicable across domains (e.g. positive affect, life satisfaction) along with variables that are particular to the population and domain being studied (e.g. acculturation).

The model has been tested with undergraduate populations in several countries and social contexts, as well as with early career adults. Results typically indicate that the model offers a good fit to the data. To date the model has not been tested with graduate students, so one aim of the present study was to assess the model’s utility in explaining graduate student well-being.

**Psychological flexibility**

Psychological flexibility is a construct that encompasses behavioral processes involved in the ability to dynamically adapt responses to demands in the environment. This can be contrasted with psychological inflexibility, which is marked by a narrow
range of behavioral responses coupled with an insensitivity to context. For example, people struggling with depression experience low mood or anhedonia across a range of circumstances, and demonstrate a restriction in range of behavior such as disengagement from previously enjoyed activities (Kashdan & Rottenberg, 2010).

Evidence from multiple studies suggests that psychological inflexibility is involved with a wide variety of psychological disorders and behavioral problems, and that interventions designed to increase psychological flexibility are efficacious in their treatment (A-tjak, Davis, Morina, Powers, Smits, & Emmelkamp, 2015; Powers, Vörding, & Emmelkamp, 2009; Smout, Hayes, Atkins, Klausen, & Duguid, 2012).

Psychological flexibility was selected as a promising construct for the current study for two reasons. First, it appears to be a good conceptual match when considering what differentiates graduate students who thrive from those who have difficulty coping with stress. Persons who are higher in psychological flexibility are more likely to persist in behavior that makes progress towards long-term goals while mindfully accepting the unpleasant affect that may result in the short term (Bond, Flaxman, & Bunce, 2008).

Second, when considering a well-being perspective, psychological flexibility has been proposed as “a fundamental aspect of health” (Kashdan & Rottenberg, 2010). Kashdan and Rottenberg assembled evidence from research into concepts such as executive function, self-regulation, ego resiliency, time perspective, personality, and stress coping. Their conclusion was that in all of these processes, flexibility was the common component that contributed to well-being. Thus, they argued that psychological flexibility is “the essence of health” as it allows people “to better tolerate and effectively
use emotions, thoughts, and behavior to extract the best possible outcomes in varying situations.”

This analysis suggests that psychological flexibility may represent a promising factor for explaining how some students maintain well-being while navigating the complex demands of graduate school.

**Advising and mentoring.** Psychological flexibility is typically seen as a quality of the individual, but it is not a quality that exists in isolation, it is always a quality of the individual responding to their environment. Since environments shape and provide consequences for people’s responses, it follows that some environments will enhance psychological flexibility better than others.

The concept of “nurturing environments” has been articulated to identify the features of environmental contexts that foster the well-being of the people within them. In synthesizing prevention science research, the authors of the concept identify four features of such environments. They minimize “biologically and psychologically toxic events”, cultivate prosocial behavior, limit opportunities for problematic behavior, and promote psychological flexibility (Biglan, Flay, Embry, & Sandler, 2012).

A key feature of the graduate school environment that serves these functions is the relationship between a student and their advisor(s). The advising relationship has been consistently identified as a crucial factor in graduate student success (e.g. Gelso & Lent, 2000; Sowell, Bell, Kirby, & Naftel, 2010; Zhao, Golde, & McCormick, 2007) A beneficial advisor relates to their advisee in psychologically healthy ways, encourages adaptive behavior, notices and discourages maladaptive behavior, and helps the advisee
to be clear about their values and goals and to persist in the face of difficulty (Schlosser & Gelso, 2001).

Thus, in addition to the importance of psychological flexibility, the advising relationship is key to predicting the well-being of graduate students.

**Purpose**

The purpose of this study was to explore factors that are amenable to change that predict graduate student well-being. This was accomplished by utilizing Lent’s normative model of well-being to organize general and domain-specific variables. Psychological flexibility, the advising relationship, and academic stress were incorporated into the model as domain-specific variables. The hypothesized conceptual model is presented in Figure 1.
**Figure 1:** Hypothesized conceptual structural model of domain-specific and global well-being for graduate students.

This study addressed several gaps in the literature. It contributed to a better understanding of graduate student mental health, which has been neglected relative to undergraduate mental health. It examined graduate student mental health from a well-being perspective, to help balance the emphasis on studying dysfunction. The usefulness of Lent’s well-being model was tested with a graduate student population, which has not been done previously. The relationship of psychological flexibility to other well-being variables was tested within the context of Lent’s model, which has not been carried out in prior research. Finally, the role of psychological flexibility in predicting graduate student well-being was explored, a question that has not been previously addressed.
The specific hypotheses tested were:

*Hypothesis 1:* The model will provide an adequate fit to the data, as measured by fit statistics of CFI greater than .90, RMSEA less than .08, and SRMR less than .08.

*Hypothesis 2:* A model including psychological flexibility will demonstrate better fit to the data and explain more variance in life satisfaction than a model without psychological flexibility. This will be assessed by comparing the models via the $\chi^2$ difference test and the $\Delta$CFI > .01 criterion.

*Hypothesis 3:* Psychological flexibility will predict academic and life satisfaction as indicated by significant paths in the model from psychological flexibility to academic satisfaction, and from psychological flexibility to life satisfaction.

*Hypothesis 4:* Psychological flexibility will moderate the relationship between academic stress and academic satisfaction, and the relationship between academic stress and life satisfaction. It will moderate the relationships by decreasing the influence of academic stress.
Chapter Two

Literature Review

This chapter presents a review of the literature on well-being generally, Lent’s integrative model of well-being, graduate student stress and mental health, and psychological flexibility. The chapter begins with an overview of the two major traditions in well-being research. Next, calls for integration between these traditions are presented. Then Lent’s integrative model is presented, along empirical findings demonstrating the model’s relevance to the current study. The chapter moves on to the topic of graduate student stress and mental health, emphasizing specific factors that impact the well-being of graduate students. The chapter concludes with a review of the construct of psychological flexibility, and a presentation of the rationale for why this construct may be particularly worthy of study in relation to well-being among graduate students in stressful contexts.

Well Being

The construct of well-being has been defined as referring to "optimal psychological functioning and experience" (Ryan & Deci, 2001), or more generally, "happiness" (Kashdan, Biswas-Diener, & King, 2008). Research into well-being in the field of psychology is considered to be a modern expression of what has historically been the concern of philosophers with "the good life" (Ryan & Deci, 2001). However, what constitutes optimal psychological functioning, experience, or happiness continues to be a
matter of debate. Historically, research into well-being has been distinguished into two conceptual traditions, with differing but related foundations, definitions, and research programs. These are typically referred to as the hedonic and eudaimonic conceptions of well-being (Ryan & Deci, 2001). The hedonic tradition conceives of well-being as consisting of the presence of positive feelings, relatively fewer negative feelings, and positive evaluations of one's life (Diener, Oishi, & Lucas, 2009). The eudaimonic tradition conceives of well-being as living up to one's potential through processes such as personal growth, finding a sense of purpose in life, and developing meaningful social connections (Ryff & Singer, 1998).

The labels of hedonic and eudaimonic were born out of the influence of Aristotelian philosophy. Bradburn (1969) cited Aristotle’s use of the term “eudaimonia” to describe “the highest of all goods achievable by action.” Bradburn points out that eudaimonia is typically translated as “happiness,” but that it may be more accurate to translate it as “well-being.” This is because Aristotle, in discussing eudaimonia, was concerned with identifying the highest good to which human beings could aspire. In conceptualizing the highest good, Aristotle concluded that eudaimonia was not a feeling or a state, but the activity of living well. In contrast, the happiness that consists in feelings of pleasure is labeled “hedonia.” Bradburn was merely discussing how happiness or well-being was chosen as an outcome variable for his study of “difficulties in living,” but he unwittingly entered eudaimonia into the lexicon of well-being researchers, and foreshadowed the hedonic/eudaimonic distinction to come.

**Hedonic well-being.** The most prominent articulation of the hedonic conception of well-being comes from Ed Diener and colleagues, which they term "subjective well-
being (SWB)" (Diener et al., 2009). In this view, well-being consists of emotional and
cognitive factors. Specifically, experiencing a high level of positive emotions,
experiencing few negative emotions, and being satisfied with one's life, both overall and
in specific domains (Diener et al., 2009).

Diener and colleagues identify the utilitarian philosopher Jeremy Bentham as an
"intellectual forerunner" of the SWB perspective. Bentham, cited in Diener et al.,
proposed that the main criterion of a good life is having pleasure and lacking pain (2009).
Thus, Diener identifies the tradition of SWB research as one that focuses on people's
enjoyment, pleasure, and happiness in life, as experienced affectively and cognitively
(Diener, 1984).

Diener et al. cite a 1925 study by J.C. Flugel as an early example of SWB
research. In this study, Flugel had participants record their emotional states at various
intervals throughout the day for 30 days. Findings summarized the types of positive and
negative emotions experienced (e.g. joy, contentment, worry, depression), and overall,
participants experienced most pleasant than unpleasant emotions (Flugel, 1925). Diener
et al. also cite the use of large-scale survey studies by the Gallup organization that simply
asked people to rate how happy they were (2009).

Diener et al. also cite an intriguing finding by Bradburn, writing in 1969.
According to Bradburn's research, positive and negative affect could be seen as
independent dimensions of affect (2009). In other words, positive affect did not imply the
absence of negative affect, and vice versa. Findings such as this have supported the
theoretical and philosophical justification for a study of well-being as distinct from the
study of illness, and a conception of well-being as more than simply the absence of
illness, not only in the hedonic tradition but in the eudaimonic as well (Ryan & Deci, 2001).

In addition to affective aspects, Diener, citing Andrews and Withey (1976), cites cognitive evaluations regarding satisfaction with one's life as a key factor in SWB (1984). Andrews and Withey set out to develop measurements to measure perceived quality of life. The model they developed conceptualizes life satisfaction as a process of cognitively evaluating important aspects of one’s life and integrating those evaluations into an overall sense of satisfaction with one’s life (1974).

Early research in the SWB tradition often utilized single-item scales to measure overall well-being. While these scales demonstrated some reliability and validity, they failed to distinguish the possibility that multiple factors influence happiness or satisfaction, and relied on participants to integrate these influences in providing a response (Diener, 1984). A series of studies by Lucas, Diener, and Suh (1996) demonstrated that positive affect, negative affect, and life satisfaction were separate factors that contributed to SWB and could be reliably measured with multi-item scales.

Thus, it can be seen that the historical tradition of studying positive and negative emotions has led to the way that the broader construct of well-being is operationalized and measured in the SWB tradition. Survey research is by far the prominent approach, involving questions that ask people how they feel, and about the cognitive evaluations that influence how they feel regarding their lives. As cited by Lent (2004), the title of a 1979 article by Irwin, Kammann, and Dixon exemplifies this approach: "If you want to know how happy I am, you’ll have to ask me." Similar sentiments can be expressed regarding other positive emotions, negative emotions, and satisfaction with life domains.
Various measures of affect and satisfaction exist, however one of the most common employed for measuring affect in the SWB tradition is the Positive and Negative Affect Scale (PANAS) developed by Watson, Clark, and Tellegen (1988). This scale presents participants with emotion words and asks them to rate on a 5-point Likert scale how much they feel a particular emotion within a specified time frame.

Diener, Emmons, Larsen, and Griffin developed the Satisfaction With Life Scale (SWLS, 1985) to assess the cognitive evaluation component of SWB. The SWLS is a 5-item scale featuring items that measure global assessments of life satisfaction.

Diener et al. (2009) reviewed theoretical approaches regarding the causes of SWB, and categorized them into three groups: need or goal satisfaction theories, process or activity theories, and genetic and personality theories. Need or goal satisfaction theories posit that happiness comes about as a consequence of needs being fulfilled or goals being met. Process and activity theories suggest that happiness occurs when people are engaged in personally meaningful activity, or when they are making progress towards personally relevant goals or values. Finally, genetic and personality theories claim that happiness is a matter of relatively stable traits or dispositions, which are likely established by genetic inheritance, early experience, or a combination of the two (e.g. Diener, Suh, Lucas, & Smith, 1999; Lykken & Tellegen, 1996; Weiss, Bates, & Luciano, 2008).

Higher levels of subjective well-being are important not only for how good individuals feel, but because they are associated with a range of positive outcomes that are generally considered as socially desirable. Lyubomirsky, King, and Diener (2005) conducted a meta-analysis of literature detailing studies in which measures of happiness,
satisfaction, well-being, and related constructs were associated with positive outcomes such as friendship, income, education, health, and relationship status. Their findings indicated that subjective well-being had a causal role in promoting desirable experiences and behaviors that lead to successful education, career, and social outcomes.

Finally, cross-cultural examinations of subjective well-being have demonstrated similarities and differences between cultures. Summarizing this research, Diener, Oishi, and Lucas (2003) put forward several important findings. First, there are differences in the mean level of life satisfaction between nations. In other words, the people in some countries generally report more satisfaction with their lives than others. Second, within nations, different groups report differing levels of life satisfaction. Perhaps unsurprisingly, indicators of national wealth have been found to correlate strongly ($r = .60 - .70$) with measures of well-being for residents of those nations. Personal income most strongly correlates with well-being at low levels of income, likely due to survival needs being impacted most significantly by variations in income at lower levels. At higher levels of income, the relation to well-being becomes less significant. The authors speculated that national wealth may serve as a proxy for many other societal goods, such as a respect for human rights, the rule of law, and democratic ideals, but conceded that it has been difficult to statistically disentangle these factors in relation to well-being.

Third, Diener et al. note that persistent cognitive biases have been detected in the response styles of different cultures, which leads to different evaluations of satisfaction. They cite findings that cultures tend to display differences in retrospective evaluation. Some demonstrate a self-enhancement bias, such that people from that culture over-evaluate how well aspects of their lives are going, while other cultures display a self-
critical bias, such that they tend to evaluate aspects of their lives more negatively.

Differences in prospective evaluation occur as well. Individuals in collectivist societies tend to focus on negative possibilities, and are concerned with avoiding negative outcomes, while individuals in more individualistic societies tend to focus on positive possibilities and are concerned with moving towards positive outcomes.

There is evidence to suggest that the affective and cognitive components of SWB are emphasized differently across cultures. For example, as cited in Diener et al. (2003), Asakawa and Csikszentmihalyi (1998) found that Asian-American students were more likely to enjoy activities related to long-term goals, and European-American students were more likely to enjoy activities that were related to current interests, and to dislike activities related to long-term goals. The authors speculate that a cultural difference in prioritizing long-term goals while deemphasizing present moment positive affect may lead to higher life satisfaction (the cognitive component of SWB) in the long run (Diener et al., 2003).

Similarly, while life satisfaction is important across cultures, what predicts life satisfaction differs across cultures. Diener and Diener (1995), cited in Diener et al. (2003), found that satisfaction with self was predictive of life satisfaction in individualistic cultures but less so in collectivist cultures. Citing Suh and Diener (2001), Diener et al. (2003) explained that among European Americans, positive emotions were most predictive of life satisfaction, with acceptance by friends and family being a nonsignificant predictor. Among Asian Americans, acceptance by friends and family was equally important as positive affect in predicting life satisfaction.
An area of current research activity in SWB has to do with what is termed "hedonic adaptation," which refers to the tendency for people to return to a hypothesized hedonic "set point" after experiencing either positive or negative events (Diener et al., 2009). As cited by Diener et al., a classic study in this area was published by Brickman, Coates, and Janoff-Bulman in 1978. In this study, people who had won lotteries and people who had suffered spinal cord injuries were interviewed about their happiness before their life-changing experiences, their happiness at the present time, and how happy they expected to be in the future. Findings suggested that while significant life events affected happiness, the magnitude of the effect was less than expected, and that people's happiness demonstrated adaptation to these events over time. A limitation of the study was the cross-sectional nature and the authors advocated longitudinal studies to examine the process of adaptation in greater detail.

Since that time, longitudinal studies have been conducted. Diener et al. (2009) cite several by Lucas and colleagues that demonstrate persistent negative effects of events such as divorce, unemployment, and disability on SWB, with little evidence of adaptation in the face of life-changing events. It appears that people demonstrate both adaptation and change in SWB in response to significant life events, and research is ongoing to better understand why some people vary in their response to events, and why some events promote adaptation and others do not.

Over 30 years of research into the structure, measurement, causes, and outcomes of SWB demonstrates that affect and satisfaction provide compelling explanations and serve as powerful predictors for a range of human experiences and phenomena relevant to counseling psychology.
Eudaimonic well-being. A eudaimonic perspective on well-being has been advanced by Carol Ryff and colleagues. As with Diener (1984), Ryff identified a historical imbalance in the field of psychology between the study of dysfunction and the study of optimal function as an impetus for the growing interest in the study of well-being (Ryff, 1989). Articulated in her 1989 article, Ryff's perspective, dubbed "psychological well-being" (PWB), considers well-being to consist of six dimensions which represent a synthesis of prior psychological and philosophical theorizing on what constitutes human well-being.

Ryff’s primary objection to the hedonic perspective that prevailed at the time was that the hedonic perspective was not based on theory. Rather, the emphasis on positive affect, negative affect, and life satisfaction arose out of empirical findings from studies that were not intended to define the “essential features of psychological well-being” (1989, p. 1069) Ryff contended that this approach likely omitted “important aspects” of well-being (p. 1069).

In an effort to identify and test aspects of well-being that had been previously neglected in the empirical literature, Ryff undertook a review of theories of psychological development, mental health, and personal growth. She included perspectives from theorists such as Rogers, Jung, Maslow, and Erikson. From this she developed a set of six dimensions of “positive psychological functioning” that she proposed were shared among the theories. These dimensions are self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (1989).

Ryff constructed instruments to assess these six dimensions, and administered them along with measures that were typical of hedonic well-being research at the time.
Results indicated that Ryff’s dimensions of self-acceptance and environmental mastery correlated significantly with existing well-being measures, but positive relations with others, autonomy, purpose in life, and personal growth did not (1989). This lent support to Ryff’s contention that existing approaches to understanding well-being were inadequate.

Ryff has dubbed this 6-dimensional model “psychological well-being” and has continued its examination and promotion into the present day (e.g. Ryff, 2014). Several studies using confirmatory factor analysis have demonstrated the validity of the 6-dimensional model (Ryff & Singer, 2008).

Several noteworthy findings have emerged from studies employing Ryff’s model. Data from the Midlife Development in the U.S. (MIDUS) survey demonstrated stability in some PWB dimensions and change in others across ages, as well as sex differences. Purpose in life and personal growth showed declines over time, which Ryff suggests is due to society failing to provide opportunity for older yet healthy adults. Autonomy and environmental mastery tended to increase with age, while positive relations with others and self-acceptance remained relatively stable. Educational attainment was positively associated all PWB dimensions, and especially with purpose in life and personal growth (Ryff & Singer, 2008).

As with other models, big five model personality traits have been linked with PWB. A longitudinal study of females beginning in adolescence found positive associations between extraversion and higher scores on all six PWB dimensions in middle age. Conversely, neuroticism in adolescence was associated with lower scores on all dimensions in middle age (Ryff, 2014).
Physical health has also been shown to be related to PWB. Having higher scores across multiple PWB dimensions is associated with a lower incidence of chronic conditions among adults. Regular physical exercise predicts higher ratings on the PWB scales. Persons who sleep well received higher scores on all dimensions of PWB except autonomy. A handful of studies have suggested that high levels of eudaimonic well-being are associated with biomarkers indicative of health (e.g. lower cortisol, lower inflammatory markers), and that hedonic well-being is not associated with the same markers. Gene expression has been linked to hedonic and eudaimonic well-being, with eudaimonic well-being associated with decreased expression of genes involved in pro-inflammatory and immunity-depressing functions, and hedonic well-being associated with increased expression of the same genes (Ryff, 2014).

There is evidence for the validity of Ryff’s model across demographic groups in the United States. Ryff and Keyes conducted a randomly selected telephone based survey ($n = 1,108$) of adults over 25 in the contiguous 48 states. Confirmatory factor analysis results supported a 6-factor model with a second-order single factor as the best fit to the data (1995).

There have been several studies that provide evidence for the cross-cultural validity of Ryff’s model. Cheng and Chan (2005) examined Ryff’s model with a sample of adults from Hong Kong ($n = 1,259$). Confirmatory factor analysis supported a 6-factor model without a single second-order psychological well-being factor. Lindfors, Berntsson, and Lundberg developed a Swedish translation of Ryff’s scales and tested them with a sample of Swedish adults ($n = 1,260$). Their confirmatory factor analysis supported a 6-factor model with a single second-order factor (2006). A 2007 study
translated the scales into Spanish and administered them to adults in Spain (n = 592) and Colombia (n = 327). A 6-factor model with a second-order factor was supported (van Dierendonck, Diaz, Rodriguez-Carvajal, Blanco, and Moreno-Jimenez). A sample of Italian (n = 619) and Belarusian (n = 495) students were administered translated scales and confirmatory factor analysis supported a 6-factor with second-order factor model with both groups (Sirigatti et. al, 2012).

The tradition of eudaimonic well-being research is far more divergent than the hedonic tradition. While Ryff’s model is prominent, conceptions of eudaimonia vary considerably when compared to the hedonic tradition. For example, Ryan and Deci’s Self Determination Theory (2001) is another widely employed model that posits satisfaction of psychological needs for autonomy, competence, and relatedness leads to both hedonic and eudaimonic well-being. Seligman’s PERMA model (2011) defines well-being as consisting of positive emotions, engagement, relationships, meaning and purpose, and accomplishment.

What is clear is that the field of well-being research is far from achieving a unified consensus regarding definitions, measurement, methodology, and application. On the other hand, there appears to be increasing willingness to engage in conceptual cross-fertilization, with researchers going beyond the hedonic and eudaimonic categories to examine the interplay of constructs from both traditions (e.g. Henderon & Knight, 2012).

The current study examines the graduate student experience from a well-being perspective because well-being can be considered as the outcome of personally relevant interrelating factors, including factors that buffer against stress or that allow one to find meaning and value in stressful pursuits. It is hypothesized that by testing a domain-
specific model of graduate student well-being, a model with adequate fit to the data will be produced.

**Integrative perspectives.** Well-being researchers from the hedonic and eudaimonic camps have presented strong cases for their respective positions. In recent years, theoretical and empirical arguments have been advanced with the aim of integrating these diverse perspectives on well-being. Todd Kashdan, Robert Biswas-Diener (Ed Diener's son), and Laura King have presented conceptual, methodological, and quantitative evidence for considering hedonia and eudaimonia as a single higher-order well-being factor (2008; 2009). A recent study conducted by Kashdan's lab analyzed data from the International Wellbeing Study, involving responses from 7,617 participants from 109 countries, who completed commonly used measures of both hedonic and eudaimonic well-being. Hedonic and eudaimonic factors demonstrated a correlation of $r = .96$, supporting the single-factor well-being hypothesis (Disabato, Goodman, Kashdan, Short, and Jarden, 2015).

Kashdan et al. argue that the data do not support the distinction between hedonic well-being and eudaimonic well-being as distinct constructs. Rather, they argue that factors promoted as indicators of eudaimonic well-being often lead to, or co-occur with, indicators of hedonic well-being (2008). In other words, people who have lives that are meaningful, connected, purposeful, and accomplished feel more positive affect, less negative affect, and are more satisfied with their lives. They contend that there are not two qualitatively different types of happiness, but rather there are two traditions of happiness research. This is not taken to mean that the traditions are incorrect or mistaken. Rather, what the data suggest is that there are multiple pathways that lead to well-being,
and the existence of these multiple pathways accounts for the differences in research traditions (2009).

**Lent’s integrative model.** Over a decade ago, noted counseling psychologist Robert Lent anticipated such developments with the development of models that integrate hedonic and eudaimonic perspectives on well-being within a social-cognitive framework. Lent proposed two models: a normative model of well-being that would account for predictors of well-being in everyday contexts, and a restorative model that describes how well-being may be regained in the wake of distressing experiences or conditions (Lent, 2004).

Since that time, Lent's normative model has been tested with diverse student populations including Taiwanese and Singaporean college students (Sheu, Chong, Chen, and Lin, 2014), Mexican-American college students (Ojeda, Flores, and Navarro, 2010), Portuguese college students (Lent, Taveira, Sheu, and Singley, 2009), and engineering students (Lent, Singley, Sheu, Schmidt, and Schmidt, 2007). These studies have demonstrated that the model provides adequate to good fit to the data.

Lent's normative model of well-being represents an effort by a counseling psychologist to produce an integrated account of well-being. There are several reasons why this model may be considered ideal for the purpose of examining the concept of well-being with an eye towards the relevance for counseling psychology. First, as Lent lays out in his original article, he constructed the model with the aim to "revisit and restimulate" the counseling psychology tradition of promoting the well-being of those served by counseling psychologists, in contrast to the medical model which focuses on remediating pathology (2004). The factors he chose to incorporate into the model are
relevant to the practice of counseling psychology, in that they are person factors that can be influenced by a therapeutic relationship. Second, there is a modest but growing body of literature that has tested and demonstrated empirical support for the model. This provides validated measures and an accepted methodology for examining well-being from a counseling psychology perspective. Third, this body of literature has demonstrated support for use of the model with diverse populations crossing ethnic, cultural, and national differences. Fourth, the model explicitly incorporates factors from both the hedonic and eudaimonic well-being traditions. This approach acknowledges the important contributions that each tradition has made towards the understanding of well-being, and helps the model account for the diverse pathways to well-being that have been demonstrated in the literature. Finally, the model leaves room for examining the influence of additional, population- and domain-relevant variables.

In the original article, Lent proposed possible mediating and moderating variables that could be incorporated into the model. Other researchers have used the model with additional variables to examine issues of interest to particular populations and contexts (e.g. Garriott, Hudyma, Keene, & Santiago, 2015; Ojeda, Flores, & Navarro, 2011). Thus the model provides a framework which allows for examining the additional variables of graduate student stress and psychological flexibility with regard to well-being.

In the following section, the historical background and primary variables of Lent's model will be examined.

Lent used the framework of Social Cognitive Theory (SCT) to integrate the diverse perspectives on well-being. In his review of the extant literature, he noted that aspects of hedonic and eudaimonic well-being map well onto aspects of SCT. SWB
emphasizes affective states, domain-specific satisfaction, and life satisfaction, and SCT has a history of examining how person factors such as affect influence satisfaction with important life domains. PWB has an emphasis on striving for goals and finding meaning in life through virtuous action. SCT also has a history of examining personal goals, how people make progress towards their goals, and the salutary effects of having and striving for goals. In this way, Lent argues, a social-cognitive framework is useful for integrating the SWB and PWB perspectives while also accounting for the close correlation between these constructs (2004).

Lent's integrative model also brings together multiple theoretical perspectives that exist within the hedonic and eudaimonic traditions. Researchers in both traditions have focused on determinants of well-being that include stable, heritable personality traits, goal striving, interpersonal relationships, ability to control or influence one's situation, participation in personally meaningful activity, pleasant experiences, cognitive style, and social class (Diener, 2013, Ryan & Deci, 2001). While not including all possible variables in their original form, Lent's integrative model attempts to include many key well-being factors within its social-cognitive framework.

This integrative model also highlights aspects of well-being that reveal the applicability of well-being research, traditionally the domain of positive psychology, for counseling psychology. Lent, a counseling psychologist, notes that many of the "cognitive, behavioral, and social" factors involved in social-cognitive theory are also factors that are changeable in response to intervention and personal agency. Unlike stable factors such as genetic heritage, culture, or country of residence, social-cognitive factors represent changeable avenues for maintaining, increasing, or restoring well-being. Thus,
the use of this model is congruent with the long-standing culture of counseling psychology which emphasizes the potential for hopefulness, growth, and development of strengths.

A visual representation of the theoretical model is shown below:

![Figure 2: Lent's Integrative Model of Normative Well-Being (Lent, 2004)](image)

The arrangement of the model was guided by social cognitive theory (SCT) (Bandura, 1986). SCT seeks to account for the ways that humans learn, think, and behave in a social context through experience, observation, self-reflection, and forming beliefs and expectations. Briefly, SCT is based on the idea of triadic reciprocal determinism. This refers to bidirectional influences among "person" factors (i.e. cognitions, personality dispositions), behavior, and the environment. From the perspective of SCT, people are seen as active agents who are influenced by their environments, reflect on their experience, behavior, and ideas, and act in ways that change their environments and influence subsequent cognitions.
Given the diverse theoretical perspectives on well-being, Lent argues that SCT may be useful as a unifying framework due to its existing inclusion of personal, environmental, contextual, cognitive, and behavioral variables. In addition, SCT has been well-tested as a model that explains the influence of the environment (contextual factors acknowledged in both the hedonic and eudaimonic traditions) formation and pursuit of goals (i.e. meaningful experiences and activities in the eudaimonic sense of well-being), the influence of personality (i.e. trait affect tendencies to account for hedonic affective components of well-being) and the formation of beliefs or expectations (i.e. cognitive assessments of important life domains to account for hedonic evaluative/satisfaction components of well-being.) (Bandura, 2001).

Previous work by Lent, Brown, and Hackett (2000) applied SCT to academic and career development. In that model, known as Social Cognitive Career Theory (SCCT) they sought to use SCT to provide a unifying framework for integrating differing perspectives on career development. Prior work in career theory had generally focused on person-environment interactions, sociological influences, the identification of career-relevant traits, or even biological influences as determinants of career choices. However, these theories remained separate. SCCT provided a way to integrate and test the connections between person, environmental, and behavioral factors and career decision-making. In the same vein, an SCT framework presents a useful way to integrate various perspectives on well-being.

The key aspect of SCT that applies to the study of well-being is the focus on the process of developing personally meaningful goals and taking action to make progress towards those goals. Lent extended prior work from SCT and SCCT to propose that to the
extent a person is able to form meaningful goals and make significant progress towards those goals, they will experience higher levels of well-being. SCCT delineated the process by which people form interests, choose goals, and make progress towards goals in specific domains (i.e. relevant academic and career settings). The process of working towards personally meaningful goals is cited in both the hedonic and eudaimonic traditions as a fundamental route by which people experience well-being.

In Lent's model of normative well-being, the two primary indicators of well-being are domain satisfaction and overall life satisfaction. Domain satisfaction refers to the extent to which a person is satisfied with a specific life domain such as school, work, family, or relationships. Overall life satisfaction refers to the extent to which a person is satisfied with their life as a whole. Prior research (Rain, Lane, & Steiner, 1991) has supported a bidirectional relationship between domain and life satisfaction. In everyday language, the more a person is pleased with important aspects of life such as health, career, or relationship, the more pleased they will be with their life overall; the more a person is pleased with their life overall, the more pleased they will be with distinct aspects of life, as well.

Within this model, a fundamental influence on both domain and life satisfaction is a person's basic personality and affective tendencies. In other words, people with certain personality traits such as high extraversion and low neuroticism tend to be more satisfied with their lives, and people who experience positive affect more frequently relative to negative affect tend to be more satisfied with their lives. While personality and affective factors are not strictly deterministic of well-being, it has been demonstrated (DeNeve & Cooper, 1998) that they are significant and pervasive influences.
Aside from the influence on domain and life satisfaction, personality and affective factors are thought to influence what Lent terms environmental supports and self-efficacy expectations. Environmental supports are those influences which serve to provide models, resources, and opportunities that facilitate positive development and are important to "maintaining and enhancing well-being" (Lent, 2004). Environmental supports, broadly construed, include one's family, relationship, community, society, and national contexts. These contexts determine, for example, the possibilities that people perceive for their lives, the educational and career experiences one may have, and the financial and material resources that are available. Lent especially calls attention to the "social and relational" supports that fall into this category. Enjoying support from family, friends, community, and culture is nearly invaluable in the pursuit of meaningful goals and in experiencing the benefits of one's society. Well-being research has presented theoretical and empirical justifications for the importance of positive, helpful relationships with others. Within Lent's model, environmental supports are proposed to be a direct influence on domain satisfaction for the reason that people are more likely to be satisfied in particular domains if they perceive that the contexts they are in support their goals and provide relevant resources for pursuing those goals.

Research with graduate students has demonstrated that environmental support in the form of advising and mentoring relationships is a crucial component of a positive graduate school experience. A survey of over 3,000 graduate students found that having better relationships with advisors was associated with better mental health and a higher likelihood of utilizing campus mental health services (Hyun, Quinn, Madon, & Lustig, 2004). According to the Ph.D. Completion Project, 65% of those who completed a Ph.D.
cited advising relationships as important to their degree completion (Sowell, Bell, Kirby, & Naftel, 2009).

A survey of counseling psychology doctoral students ($N = 284$) demonstrated that advisor support significantly predicted ($\beta = -0.12$) student burnout (Clark, Murdock, & Koetting, 2009). A 2016 study of psychology doctoral students ($n = 228$) found that perceived faculty support was the best predictor of academic and life satisfaction, explaining 13% of the variance in academic satisfaction and 7% of the variance in life satisfaction (Tompkins et al., 2016).

Apart from direct effects on domain satisfaction, environmental supports, along with the previously mentioned personality and affective dispositions, are considered to contribute to the formation of self-efficacy expectations. Self-efficacy expectations refer to the beliefs that people hold about their ability to carry out effective actions in particular domains. Some writers treat self-efficacy as a global assessment of one's abilities. However, Bandura, the originator of the concept, as well as Lent, emphasize that self-efficacy comprises a dynamic set of beliefs and expectations that are sensitive to history and context. For example, people may have high self-efficacy in a domain in which they have experienced success, and relatively low self-efficacy in domains to which they have little exposure.

Outcome expectations are another component of the social-cognitive model. Outcome expectations refer to beliefs that people have regarding the potential consequences of their actions. For example, graduate students may have the expectation that successfully completing graduate school will lead to a fulfilling career. In the social-cognitive model, outcome expectations are influenced by environmental supports and
self-efficacy expectations. Environmental supports can influence outcome expectations by providing models and information about possibilities. Salient members of one's community can serve as examples of the kinds of educational and career experiences one can expect to encounter. Self-efficacy expectations also influence outcome expectations by allowing people to evaluate likely consequences based on their past performance in relevant domains.

Participation in goal-relevant activity or making progress towards goals is the factor that completes the model. Environmental supports, self-efficacy expectations, and outcome expectations are hypothesized to influence the formation and pursuit of goals. In other words, a person who believes they have the ability to accomplish a goal, who perceives that they have the resources and support of their community, and who believes that pursuing a goal will have positive consequences, is more likely to develop, pursue, and make progress towards a relevant goal.

Pursuing a goal and making definite progress influences domain-specific and overall well-being. Lent proposes that when people are engaged in pursuing personally meaningful goals and when they perceive that they are making significant progress towards those goals, they feel more satisfied in the particular domain in which those goals exist, and with their lives in general.

Lent also suggested that other paths and relationships are involved in the model shown in Fig. 1, that were not included in the diagram for sake of clarity. Reciprocal influences should exist between overall life satisfaction and domain specific satisfaction, in order to account for the influence of relatively stable personality characteristics on satisfaction. Goal progress should also influence self-efficacy expectations and outcome
expectations. Whether a person is making progress or not towards personally meaningful goals will serve to update their expectations about their abilities and potential consequences. In addition, domain-specific satisfaction is thought to influence self-efficacy, as one's current evaluation and feelings about performance in valued domains provides information about the relative success of one's actions.

The current study employs Lent’s model as it explicitly integrates hedonic and eudaimonic well-being factors within a framework informed by the history and aims of counseling psychology. Furthermore, the model has been extensively tested with individuals in academic settings, lending validity to its use in examining graduate students. Finally, it has demonstrated flexibility in allowing for inclusion of context- and domain-specific variables. It is hypothesized that using Lent’s theory of well-being will result in a model that provides good fit to the data and allows for the testing of relationships between relevant factors in the model.

Stress

The concept of stress in its modern form was put forth by physician Hans Selye (Lazarus & Folkman, 1984). As a medical student, Selye was puzzled that patients could suffer from a variety of maladies yet present the same reactions. Years later, his research focused on the generalized physiological responses of organisms to various demands, and he began to use the term “stress” to describe these responses (Selye, 1973). Selye’s work popularized the concept of stress as a biological phenomenon and it soon became a major topic of research in the medical and biological sciences (Lazarus & Folkman, 1984).

Richard Lazarus and Susan Folkman produced the landmark work Stress, Appraisal, and Coping in 1984, which advanced the concept of stress as psychological
responses to environmental demands. Lazarus and Folkman offer the following definition: "Psychological stress is a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being." (1984, p. 21)

Thus events themselves cannot be said to be stressful or not. It is a person's appraisal, or cognitive judgments about events, and their judgments about their ability to cope with these events that determine whether or not events are experienced as stressful.

The experience of stress is pervasive across populations in the United States. A survey conducted in 2015 by the American Psychological Association (APA) found that 42% of adults reported “feeling nervous or anxious” and 33% reported experiencing “constant worrying” as a result of stress over the previous month (APA, 2016). 13% reported being diagnosed with an anxiety disorder (APA, 2016). A 2014 survey conducted by NPR, the Robert Wood Johnson Foundation, and the Harvard School of Public Health found that 26% of respondents reported experiencing a “great deal” of stress in the previous month, and 49% reported experiencing an “extremely stressful event” during the previous year (NPR/RWJF/HSPH, 2014).

Stress is linked to a number of adverse physiological outcomes including, cardiovascular disease, progression of HIV infection to AIDS, reduction in immune function, and an increase in upper respiratory infection (Cohen, Janicki-Deverts, & Miller, 2007; Schneiderman, Ironson, & Siegel, 2005). Psychological sequelae of stress include depression, anxiety disorders, and in the case of traumatic stressors, acute stress disorder and post-traumatic stress disorder. Behavioral concerns associated with stress include substance use (including alcohol and tobacco), sleep problems, overeating,
undereating, and accidents (Schneiderman et al., 2005). Stress can be associated with behaviors that are harmful to interpersonal relationships, such as anger with spouses, children, and co-workers (APA, 2016).

**Graduate students and stress.** Graduate students frequently experience stress as well. Results from the 2016 American College Health Association’s National College Health Assessment indicate that in the 12 months prior to the survey, 81% of graduate and professional students reported feeling “overwhelmed with all [they] had to do.” 80% reported feeling “exhausted (not from physical activity).” 55% experienced “overwhelming anxiety.” 40% reported that “Academics were traumatic or very difficult to handle.” 47% rated their stress level as “more than average stress,” and 13% endorsed a rating of “tremendous stress.” (ACHA, 2016).

A 2004 survey of graduate students at the University of California, Berkeley echoes these results. Nearly 45% reported experiencing an “emotional or stress-related problem” during the past year. Feeling “overwhelmed” either “frequently” or “all the time” was reported by 46% of the graduate students (Hyun, Quinn, Madon, & Lustig, 2006).

Outcomes that are of particular importance to graduate students include higher attrition rates, lower satisfaction with academic program, lowered research productivity, procrastination, and difficulties with assistantships and practicum work (Lepp, Remnik, Leijen, & Leijen, 2016; Lovitts, 2001; Wyatt & Oswalt, 2013).

Results from the ACHA survey ($n = 13,125$) indicate that stress-related mental health diagnoses are prevalent among graduate students. The ACHA reported that within the 12 months prior to the survey 16.6% had been diagnosed or treated for anxiety, 13%
for depression, 4.9% for insomnia, 6.6% for panic attacks. 9.6% reported both depression and anxiety (2016).

A 2017 study compared Belgian Ph.D. students \( (n = 3,659) \) to member of the population at large who had some higher education \( (n = 769) \), employed persons with higher education experience \( (n = 592) \), and current students in higher education programs \( (n = 333) \). Compared to these other groups, Ph.D. students were twice as likely to be experiencing psychological distress, and nearly 2 to 3 times as likely (depending on the comparison group) to develop a psychological disorder. In addition, high job demand with low job control, and a lassiez-faire leadership style on the part of advisors were associated with more distress among the Ph.D. students (Levecque, Anseel, De Beuckelaer, Van der Heyden, and Gisle).

A survey by the National Research Consortium of Counseling Centers in Higher Education that included 12,080 graduate students revealed that 3% of graduate students had seriously contemplated suicide in the past 12 months. 0.22% of graduate students reported a suicide attempt within the past 12 months (Brownson, Drum, Becker, Saathoff, \& Hentschel, 2016).

There are similarities and differences in sources of stress between the population at large and graduate students. According to the APA, money concerns are the most common source of stress for the adult population at 67%, with work coming in a close second at 65%. Family responsibilities and health concerns follow at 54% and 51% respectively (APA, 2016). Brownson et al. surveyed 12,000 graduate students in the United States from 73 institutions. Responses indicated that academics was the most prevalent stressor with 73% of students endorsing. The second most common stressor
was financial problems with 31% endorsing. Romantic relationships and life transitions were both endorsed by 27% of the respondents. Family problems rounded out the top 5 with 20% endorsing (2016). A qualitative study of doctoral students reported that an “overwhelming number” of their participants cited a lack of mentorship and faculty support as a source of concern. Participants also reported persistent concerns about funding, particularly within the context of a demanding workload (Nyquist & Woodford, 2000).

According to the Ph.D. Completion Project, attrition rates for doctoral programs are just over 25% after 5 years and just over 30% after 10 years, across all fields of study (Sowell, Zhang, Redd, & King, 2008). Undoubtedly, experiences of overwhelming stress contribute to the decision to leave a graduate program for some students.

For graduate students, the demands of their academic program represent one of the greatest sources of stress in their lives. The current study examined the influence of academic stress on academic satisfaction and overall life satisfaction. It was hypothesized that academic stress will have a negative relationship with academic and life satisfaction, but that this relationship will be moderated by psychological flexibility, which will be discussed in the following section.

**Psychological flexibility**

Psychological flexibility has been defined as "contacting the present moment fully as a conscious human being, and based on what the situation affords, changing or persisting in behavior in the service of chosen values." (Hayes, n.d.). Another definition describes psychological flexibility as “the ability to vary one’s responses in a contextually dependent manner in order to appropriately meet situational demands”
In other words, psychological flexibility is the ability to be responsive to one’s environment and subjective experience, while simultaneously engaging in behavior that is appropriate to the situation and is in accordance with one's values.

At a behavioral level, psychological flexibility is demonstrated when people persist in working towards goals or acting in accordance with their values despite aversive experiences. Basic behavioral research has demonstrated that an organism’s typical response to aversive stimuli is to behave in such a way as to escape, avoid, or otherwise cause the aversive stimulus to cease. (Hayes, Strosahl, & Wilson, 2011) In extreme cases where none of these are possible, as Seligman (1972) demonstrated, organisms will evidence learned helplessness. In all of these cases, a narrow repertoire of behavior is expressed. In other words, behavior in the presence of aversive stimuli tends to be inflexible. It tends to be focused solely on reducing or eliminating contact with the aversive stimuli.

In contrast with this typical response pattern, in many aspects of life, we can observe human beings purposefully engaging in and persisting with activity that brings them into contact with aversive stimuli. In the pursuit of fitness, people engage in physical exercise even when it is difficult (e.g. Teixeira, Carraca, Markland, Silva, & Ryan, 2012). For the sake of the fulfillment of parenting, people have children despite reporting lower levels of happiness as a result (e.g. Nelson, Kushlev, & Lyubomirsky, 2014). In all of these examples it can be observed that some people are able to respond to difficulties and challenges flexibly, by repeatedly approaching aversive situations and events in order to reach goals or enact values. In all of these cases it can also be observed
that other people respond inflexibly, acting to escape or avoid the difficulties involved in such courses of action, at the cost of desired outcomes.

Psychological flexibility has been linked with a number of positive outcomes, and a lack of psychological flexibility has been linked with a number of negative outcomes (Kashdan & Rottenberg, 2010). Proponents of the psychological flexibility construct claim that psychological inflexibility is a, if not the, fundamental process underlying the development and maintenance of many psychological disorders (Levin et al., 2014).

Kashdan and Rottenberg have proposed that the construct of psychological flexibility describes a "fundamental" component of well-being. They acknowledge the importance of traditional perspectives on well-being, while raising the criticism that these perspectives tend to portray well-being as a static condition. In addition to these perspectives, they argue, is the need to examine the ways in which people respond to their constantly changing environments. After reviewing evidence from a variety of traditions, they conclude that the ability to respond flexibly to varying conditions is key to psychological health and social functioning, and that inflexibility is central to psychological pathology and relational difficulties (2010).

Given the view of Kashdan, Rottenberg, Hayes, Strohsal, Wilson, and many others, it follows that the hypothesized fundamental role of psychological flexibility in well-being bears examination. Lent’s model, being both integrative and adaptive, was chosen to explore the role of psychological flexibility.

The role of psychological flexibility has been examined in a variety of clinical concerns, primarily through the administration of Acceptance and Commitment Therapy (ACT). ACT has demonstrated efficacy in treating depression (e.g. Bohlmeijer,
The benefits of psychological flexibility have been demonstrated in a variety of contexts. Most of the research focuses on clinical concerns, but work has also been done in organizational, performance, and cultural change settings.

Kashdan, Morina, and Priebe (2009) conducted a study with Kosovo war survivors who had experienced a mean of 11 traumatic events during the war. Among participants meeting criteria for PTSD, psychological flexibility mediated the effect of PTSD on quality of life. Additionally, participants who were high in psychological flexibility and who did not meet criteria for an anxiety disorder reported the highest quality of life, while absence of disorder by itself was not sufficient to predict a high quality of life.

Kashdan and Kane (2011) found that psychological flexibility moderated the relationship between post-traumatic distress and post-traumatic growth and meaning in life. Participants who reported higher levels of post-traumatic distress reported higher levels of post-traumatic growth, but only when also reporting high psychological flexibility. When reporting higher levels of psychological flexibility, there was no effect from post-traumatic distress on meaning in life. However, when reported psychological
flexibility was low, post-traumatic distress was associated with lower meaning in life (Kashdan & Kane, 2011).

Bond, Flaxman, and Bunce (2008) surveyed call center workers \( (n = 488) \) in the United Kingdom regarding psychological flexibility, job control (the perceived ability to influence one’s working environment), learning and performance with a new software program, and general health. They found that psychological flexibility predicted mental health as well as learning and performance. Results also indicated that the interaction of psychological flexibility and job control explained outcomes above and beyond either factor alone. This supports the idea that psychological flexibility has beneficial effects for many domains of functioning, and not only well-being.

Psychological flexibility has been shown to predict maternal attachment, responsiveness, and psychological symptoms among women experiencing premature birth (Evans, Whittingham, & Boyd, 2012). Among parents of children with acquired brain injuries, psychological flexibility was correlated with parental adjustment and parenting style, and changes in psychological flexibility mediated improvements in parent stress and reactivity following an intervention targeting psychological flexibility (Brown, Whittingham, & Sofronoff, 2015).

Varra, Hayes, Roget, and Fisher assigned drug and alcohol counselors to an intervention to increase psychological flexibility prior to a workshop on evidence-based pharmacotherapy for substance abuse disorders. Compared to controls, counselors in the treatment condition demonstrated significant, large increases in psychological flexibility at posttreatment and follow-up, as well as more willingness to refer clients for evidence-based pharmacotherapy (2008).
A recent survey of parents whose children suffer with asthma demonstrated that lower psychological flexibility on the part of the parents is associated with poor psychological adjustment to the child’s illness, greater psychological symptoms among the parents, and higher asthma morbidity among the children. (Chong, Mak, & Loke, 2017).

Given the theorized role of psychological flexibility in well-being, and the empirical evidence linking psychological flexibility to beneficial outcomes across a wide range of human concerns, it would not be surprising if psychological flexibility were associated with well-being among graduate students, especially students experiencing significant levels of stress. Thus, a hypothesis of the current study is that higher levels of psychological flexibility should predict higher levels of domain-specific and overall well-being.

Psychological flexibility and self-efficacy. In treating psychological flexibility as a trait, the model specifies that it should predict self-efficacy. The psychological flexibility literature supports this idea as well. Wicksell, Olsson, & Hayes stated, “both constructs involve the perceived ability to perform relevant activities in the presence of interfering private experiences such as pain or distress.” (2010, p. 1059.e3). The current study takes this perspective by examining the perceived ability to successfully carry out academic activities while experiencing academic stress.

The Wicksell, Olsson, and Hayes study focused on participants experiencing chronic pain due to whiplash injuries. In that case, self-efficacy related to perceived abilities to carry out daily activities while experiencing chronic pain. Participants were assigned to either a TAU condition or a condition that involved TAU plus an intervention.
designed to improve psychological flexibility. Participants in the TAU plus psychological flexibility condition demonstrated increases in life satisfaction and self-efficacy, and a reduction in pain-related disability. The study found no changes in pain intensity from pre- to post-treatment (2010). This is an important finding, as it supports the idea that increases in psychological flexibility can lead to improvements in activity participation and well-being even if stressful experiences themselves are not changed.

Wicksell et al. conducted a similar study examining the effectiveness of a psychological flexibility intervention with participants experiencing fibromyalgia. Participants were randomized into either a treatment condition or a waitlist condition. Similar to the first study, participants in the treatment condition demonstrated improvements in pain disability and self-efficacy, and mediational analyses indicated that these improvements were explained by changes in psychological flexibility. As in the first study, no significant changes in pain intensity were found, despite improvements in other outcome variables (2013).

Stafford-Brown and Pakenham carried out a study in which psychology trainees were administered a stress-management intervention that was designed to enhance psychological flexibility. Relative to a control group, participants who went through the treatment demonstrated significant gains in therapist self-efficacy, and these changes were maintained at a 10-week follow-up (2012). Wei et al. conducted a study which assessed psychological flexibility and counselor self-efficacy among counselor trainees. This study found that higher levels of psychological flexibility were associated with higher levels of counselor self-efficacy, and that this relationship was explained by psychological flexibility contributing to fewer “experiences of hindering self-focused
attention” (2015). In other words, trainees who were more psychologically flexible were more likely to be able to engage in useful counseling behaviors even while experiencing anxious or distracting thoughts.

While the literature examining the relationship between psychological flexibility and self-efficacy is small, theory and preliminary evidence suggest that a link is both possible and likely. In addition, the similar relationships found between psychological flexibility and self-efficacy in different domains (pain-related self-efficacy and counseling self-efficacy) supports the theoretical notion that psychological flexibility should demonstrate effects regardless of the nature of distressing experiences.

**Psychological flexibility and perceived environmental support.** Literature examining the relationship between psychological flexibility and perceived environmental support is limited. No studies were found that explicitly addressed the construct of environmental support as it is used in the social-cognitive literature while also incorporating the construct of psychological flexibility.

Theoretically, a relationship is possible. In addressing potential moderation relationships in his model, Lent discusses the likelihood that particular personality and trait variables could have influence on other constructs in the model depending on their effects on attention and information processing, and that these relationships would be targets of empirical investigation (2004). It could be the case that psychological flexibility could moderate the influence of an environment that was perceived as unsupportive, so that the detrimental effects would be reduced. This would be similar to the studies mentioned above where chronic pain intensity was unchanged, but self-efficacy was improved via changes in psychological flexibility. It could be possible that
persons higher in psychological flexibility would endorse higher perceived environmental support, as their perception would be biased by being more accepting of unsupportive elements in their environment, while emphasizing the elements of their environment that were supportive of their values and goals.

One study involving chronic pain patients raises possibilities about this relationship. Participants completed a measure that rated the perceived social support they received for their pain from either their spouse or closest caregiver. They also completed measures that assessed their engagement in activity despite pain, and their willingness to experience pain (McCracken, 2005). In this case, perceived social support is similar to aspects of perceived environmental support, and willingness and activity engagement are similar to aspects of psychological flexibility. The analysis demonstrated that chronic pain patients’ perceptions of their social environments had significant correlations with their activity engagement and willingness to experience pain (McCracken, Vowles, & Eccleston, 2005).

Another study by Elliott et al. examined factors that mediated the relationship between undercontrolled, overcontrolled, and resilient personality styles and depression and PTSD symptoms among veterans. Perceived social support and psychological flexibility were among the potential mediators examined. This study did not examine the relationship between social support and psychological flexibility. However, it found that among those with undercontrolled or overcontrolled personality styles, lower social support and lower psychological flexibility were both significant mediators of the relationship between personality and more severe depression and PTSD symptoms.
(2015). This suggests the possibility that those who are lower in psychological flexibility are more likely to experience less perceived social support.

A relatively recent development in the psychological flexibility literature that relates to the concept of environmental support concerns what is called “nurturing environments” (Biglan, Flay, Embry, & Sandler, 2012). Based on findings from prevention research, Anthony Biglan and colleagues have emphasized the role that environmental contexts play in either cultivating or diminishing well-being. Their research suggests that environments that are characterized by interactions that are socially aversive (e.g. aggression, criticism) reliably produce problematic behavior patterns, and environments that are characterized by prosocial interactions (e.g. caring, cooperation) tend to reliably produce behavior patterns that promote well-being.

According to this perspective, the four characteristics of nurturing environments are that they 1) minimize aversive social and biological conditions, 2) teach and reinforce prosocial behavior, 3) limit opportunities for problematic behavior, and 4) promote psychological flexibility (Biglan et al., 2012). As discussed earlier, graduate student advisors have been cited as important sources of support within the academic environment as well as an influence on program satisfaction. In addition, when looked at from the perspective of nurturing environments, academic advising should relate significantly with psychological flexibility.

**Psychological flexibility and goal-directed activity.** A positive relationship between psychological flexibility and participation or progress in goal-directed activity is predicted by psychological flexibility theory. Taking action to progress towards “concrete goals that are values-consistent” is explicitly included in the construct of psychological
flexibility (Hayes, Strosahl, & Wilson, 2012), and is one of the ways by which psychological flexibility promotes well-being. Due to the assumption that engaging in valued or goal-directed behavior is an integral process in psychological flexibility, it has not been typically researched as an outcome of psychological flexibility. A meta-analysis of psychological flexibility components excluded studies regarding goal-directed behavior due to the “vast and well-established” literature in this area (Levin, Hildebrandt, Lillis, & Hayes, 2012). Bond, Flaxman, & Bunce presented findings that suggest individuals higher in psychological flexibility “have a greater capacity to notice and respond more effectively to goal-related opportunities.” This is presumably because those who are more psychologically flexible are devoting less cognitive resources to avoiding or controlling unwanted internal experiences and thus have more attention to devote to goal-relevant features of their environment (2008).

Engaging in goal-directed behavior is a key process in psychological flexibility. As the originators of the construct state: “The cornerstone of psychological flexibility is the capacity to engage in highly organized and purposeful behavior that is sensitive to contingencies.” (Hayes, Strosahl, & Wilson, 2012, p. 96.)

**Psychological flexibility, domain satisfaction, and life satisfaction.**

Psychological flexibility theory suggests that higher levels of psychological flexibility should lead to higher levels of satisfaction in important domains (Bond, Lloyd, & Guenole, 2013). A handful of studies examining the relationship between psychological flexibility and job satisfaction (a domain satisfaction construct) have produced mixed findings. Bond and Bunce (2003) surveyed call center workers ($N = 412$) and found positive correlations between psychological flexibility and job satisfaction measured at
two points in time. However, when examining whether psychological flexibility at Time 1 predicted job satisfaction at Time 2 and controlling for the influence of other work-related variables, the predictive power of psychological flexibility became insignificant.

Similar studies (Bond & Bunce, 2000; Bond & Donaldson-Feilder, 2004) did not find a significant association between psychological flexibility and job satisfaction. These studies measured psychological flexibility with the AAQ, which assesses psychological flexibility in a general context. Bond, Lloyd, and Guenole developed a measure of psychological flexibility specifically focused on work contexts, the Work-Related Acceptance and Action Questionnaire (WAAQ). Preliminary tests of the WAAQ demonstrated a significant correlation between work-related psychological flexibility and job satisfaction (2013).

Another domain satisfaction construct, sexual satisfaction, was examined by Tapp (2014). Sixty-three adults were surveyed about psychological flexibility and sexual satisfaction. Results found that psychological flexibility was a significant predictor of sexual satisfaction.

The evidence for the relationship between psychological flexibility and life satisfaction appears more consistent. A study of over-65 adults (N = 187) found that higher psychological flexibility was associated with higher satisfaction in several domains of a quality of life measure (Butler & Ciarrochi, 2007). A survey of Australian university students (N = 144) found a significant correlation between psychological flexibility and life satisfaction (Marshall & Brockman, 2016). A sample of adults in the UK with muscular disorders (N = 137) found that psychological flexibility at Time 1 was predictive of life satisfaction at Time 2, 4 months later (Graham, Gouick, Ferreira, &
Gillanders, 2016). A survey of Latino college students \((N = 104)\) found that psychological inflexibility was negatively correlated with life satisfaction \((r = -0.58, p < .05)\) (Flynn, Berkout, & Bordieri, 2016).

Three studies that examined the effects of ACT-based interventions (which seek to increase psychological flexibility) demonstrated increases in life satisfaction from pretreatment to posttreatment (Dalrymple & Herbert, 2007; Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Lappalainen, Lehtonen, Skarp, Taubert, Ojanen, & Hayes, 2007).

Based on these findings, there is reason to conjecture that within the context of Lent’s well-being model, psychological flexibility will positively influence many of the variables that contribute to well-being, and will moderate the effects of variables that detract from well-being. In addition, psychological flexibility may add to the understanding of personal characteristics that influence well-being (Kashdan & Rottenberg, 2010). A hypothesis of the current study is that higher levels of psychological flexibility will predict higher levels of academic satisfaction and higher levels of life satisfaction. Another hypothesis is that psychological flexibility will moderate the effects of academic stress on academic satisfaction and life satisfaction. Finally, it was hypothesized that inclusion of psychological flexibility will result in a model that accounts for significantly more variance in well-being outcomes than a model which only includes the trait of positive affect.
Chapter Three

Method

Participants

Participants were 301 students who were 18 years of age or older, and at the time of the study were enrolled in full-time postbaccalaureate programs at institutions within the United States. 84.7% \((n = 255)\) identified as female, 12% \((n = 36)\) identified as male, 1\% \((n = 3)\) identified as transgender male, 1.3\% \((n = 4)\), identified as non-binary or third gender, 0.7\% \((n = 2)\) self-described their gender identity as genderqueer, and 0.3\% \((n = 1)\) preferred to not identify.

Participants predominantly identified as White, at 74.4\% \((n = 224)\), 7.3\% \((n = 22)\) identified as Asian, 6.6\% \((n = 20)\) identified as Black, 4.7\% \((n = 14)\) identified as Hispanic or Latino/a, 3.7\% \((n = 11)\) identified as biracial or multiracial, 0.7\% \((n = 2)\) identified as Native American, American Indian, or Alaska Native, and 2.7\% \((n = 8)\) chose to self-describe their ethnic identity.

The ages of participants ranged from 21 to 57 years old \((M = 27.88, SD = 6.05)\), with most 77.4\% \((n = 233)\) in their 20s, 17.4\% \((n = 52)\) in their 30s, 3.2\% \((n = 10)\) in their 40s, and 1.9\% \((n = 6)\) in their 50s.

The majority of participants were pursuing degrees in the category of Social and Behavioral Sciences 85.4\% \((n = 257)\). 6\% \((n = 18)\) selected Other and self-described their field, and all were variants of psychology. Degrees in Education were being pursued by
5.3\% (n = 16), 2.3\% (n = 7) were studying Arts and Humanities, 0.7\% (n = 2) were studying Physical and Earth Sciences, and 0.3\% (n = 1) was studying Biological Sciences.

In terms of degree being sought, 72.1\% (n = 217) were seeking doctorate degrees, 26.2\% (n = 79) master’s degrees, and 1.7\% (n = 5) a professional degree.

**Procedure**

Approval for all study procedures was obtained from the University of Denver’s Institutional Review Board (IRB) prior to recruitment of participants. While research suggests that graduate students worldwide face similar pressures (e.g. Levecque, Anseel, De Beuckelaer, Van der Heyden, & Gisle, 2017), participants were only recruited from within the United States in order to avoid measurement issues that could arise with cross-cultural understanding of the measures to be administered.

A minimum sample size of 200 was sought, in line with the guidelines provided by Weston and Gore (2006), with a larger sample being more desirable. Schumacker and Lomax suggested that a sample size between 200 to 500 is acceptable in most published studies that utilize SEM (2016).

Participants were recruited from institutions throughout the United States that administer graduate programs. Faculty and administrators at appropriate institutions were identified, contacted, and provided with a description of the study, and asked if they would consent to share the study invitation with students at their institutions and programs via email.

Data collection was conducted online via Qualtrics survey software hosted by the University of Denver. Prospective participants were forwarded an email that contained a
link to the survey, along with information about the study. The recruitment email included a description of the study, information about possible risks, a statement of confidentiality, and an incentive offer. Those who were interested in participation followed a link to the survey website. There they were presented with more detailed information including inclusion and exclusion criteria, IRB approval, how data would be handled, how confidentiality would be assured, information about the researcher and how to contact them with any questions, approximate time needed to take the survey, and notification of rights to end participation at any time. Participants who consented and who endorsed meeting inclusion criteria were presented with the survey which included the measures detailed below. Surveys took approximately 11 minutes on average to complete. At the end of the survey, participants were given the option to enter a drawing for 1 of 5 $20 Amazon gift cards as an incentive.

**Measures**

Several measures were selected for this study because of their use in prior studies using Lent’s (2004) well-being model, and a desire to situate the current study within the broader literature testing the Lent model. These measures include the Positive Affect subscale of the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988), an academic self-efficacy measure used in prior research (Lent, Singley, Sheu, Gainor, Brenner, Treistman, & Ades, 2005), an outcome expectations measure used in prior research (Lent et al., 2005), a goal progress measure used in prior research (Lent et al., 2005), an adaptation of the Perceived Stress Scale (Cohen & Williamson, 1988) for academic stress used in prior research (Sheu, Chong, Chen, & Lin, 2014), an academic
satisfaction measure used in previous studies (Lent et al., 2005), and the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).

The Advisory Working Alliance Inventory (Schlosser and Gelso, 2001) was selected to assess the factor of Environmental Supports within the Lent model because of the importance of the advising relationship to the success and academic satisfaction of graduate students.

The Acceptance and Action Questionnaire–II (Bond, Hayes, Baer, Carpenter, Guenole, Orcutt, Waltz, & Zettle, 2011), was selected as it is currently the standard measure used within the psychological flexibility literature.

**Demographic questionnaire.** Participants completed a demographic questionnaire featuring items regarding age, gender, ethnicity, level of educational attainment, the degree being sought in their graduate program, the student’s current year in their program, and their general field of study.

**Positive and Negative Affect Schedule** (PANAS; Watson, Clark, & Tellegen, 1988). The Positive Affect subscale of the Positive and Negative Affect Schedule is a 10-item scale used to assess the tendency to experience positive affect. Participants are asked to rate the extent to which they generally feel particular emotions. An example is the feeling “excited.” Participants rate each item on a Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely). Scores are summed, resulting in a Positive Affect (PA) score ranging from 10 to 50. Higher scores reflect more experiencing of positive emotions. Internal consistency coefficient alphas have been found to range from .86 to .90 for the positive affect subscale (Watson et al., 1988). The authors examined external validity through comparison with measures of pathology and negative affect.
They found negative correlations between the PA scale and measures of depression \((r = -.36)\) and anxiety \((r = -.35)\) (Watson et al., 1988). Coefficient alpha for scale scores in the current study was .86.

**Acceptance and Action Questionnaire-II** (AAQ-II; Bond, Hayes, Baer, Carpenter, Guenole, Orcutt, Waltz, & Zettle, 2011). The AAQ-II is a 7-item measure that is used to assess psychological flexibility. Participants rate the truthfulness of statements regarding the difficulty of thoughts, feelings, and experiences on a Likert scale ranging from 1 (never true) to 7 (always true). Scores are summed, producing a possible range from 7 to 42. Example items are “I worry about not being able to control my worries and feelings,” and “Emotions cause problems in my life.” Alpha coefficients across six samples used in the development of the AAQ-II ranged from .78 to .88 with a mean of .84 (Bond et al., 2011). The AAQ-II is actually a measure of psychological inflexibility, so higher scores indicate lower levels of psychological flexibility. For the current study, scores were reversed so that higher scores indicate greater psychological flexibility. Coefficient alpha for scale scores in the current study was .89.

**Advisory Working Alliance Inventory** (AWAI; Schlosser & Gelso, 2001). The AWAI is a 30-item measure used to assess the working alliance in advising relationships from the perspective of graduate students. Participants are asked to rate their agreement with statements about the advising relationship on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). An example item is, “My advisor offers me encouragement for my accomplishments.” Factor analysis and inspection of the data suggested the presence of three subscales, which the researchers labeled Rapport, Apprenticeship, and Identification-Individuation. Negatively worded items are reversed.
scored, and scores for the total scale are then summed, resulting in a score from 30 to 150. Higher scores reflect that the student perceives a better working relationship with their advisor. Coefficient alphas for the full scale ranged from .90 to .95 in development and evaluation studies (Schlosser & Gelso, 2001). Coefficient alpha for scale scores in the current study were .96 for the full scale, .94 for the Rapport subscale, .93 for the Apprenticeship subscale, and .77 for the Identification-Individuation subscale.

**Academic self-efficacy.** Academic self-efficacy was assessed with a 12-item scale developed for prior research with the Lent model (Lent, Singley, Sheu, Gainor, Brenner, Treistman, & Ades, 2005). These items are divided into a 5-item subscale that assesses a participant’s confidence in their ability to achieve academic milestones and a 7-item subscale that assesses their confidence in their ability to cope with barriers to academic success. Participants rate their level of confidence on a 10-point Likert scale ranging from 0 (no confidence at all) to 9 (complete confidence). A sample item for the academic milestone subscale is “How much confidence do you have in your ability to excel in your program over the next semester,” and a sample item from the academic coping subscale is “How confident are you that you could complete your degree despite financial pressures.” Coefficient alphas in the original studies were .88 and .89 for academic milestone self-efficacy, and .81 and .85 for academic coping self-efficacy. In the current study, coefficient alpha for the total scale score was .85. Coefficient alpha was .89 for the academic milestone subscale, and .81 for the academic coping subscale.

**Outcome expectations.** Outcome expectations were assessed with a 10-item scale developed for prior research using the Lent model (Lent et al., 2005). These items assess the extent to which the participant perceives positive outcomes will result as a
consequence of their academic efforts. Since the items were originally constructed for undergraduates, the wording was slightly adapted to reflect graduate school outcomes. Participants rate their agreement with each statement on a Likert scale ranging from 1 (strongly disagree) to 9 (strongly agree). A sample item is “A graduate education will allow me to obtain a well-paying job.” Scores are summed and averaged, producing an overall score ranging from 1 to 9. Higher scores indicate greater expectations for positive outcomes due to graduate school. Coefficient alphas in the two original studies were .89 and .91. The internal consistency estimate in the current study was .87.

**Academic goal progress.** Goal progress in the academic domain was assessed with a 7-item measure developed for prior research (Lent et al., 2005). These items assess the extent to which the participant perceives they are making progress on academic goals. As with the other scales developed for prior research, wording was adapted to reflect the graduate school context. Participants rated their agreement with statements about their goal progress on a Likert scale ranging from 1 (no progress at all) to 5 (excellent progress). An example item is “Completing academic requirements of your program satisfactorily.” Scores are summed and averaged, producing an overall score ranging from 1 to 5. Higher scores reflect a perception of greater progress towards academic goals. Coefficient alphas in the original studies were .84 and .86. In the current study, coefficient alpha for the scale score was .87.

**Academic stress.** Academic stress was assessed with a modified version of the 10-item Perceived Stress Scale (Cohen & Williamson, 1988) to assess stress resulting from the academic domain. In prior research utilizing the Lent model, the Perceived Stress Scale was adapted to reflect academic stress by, for example, replacing phrases
such as “in your life” with “in your academic life” (Sheu, Chong, Chen, & Lin, 2014). The current study used a similar approach, slightly modifying the language of the items to reflect the demands of graduate school. Participants indicate how often they have experienced different sources of stress on a Likert scale ranging from 0 (never) to 4 (very often). An example is, “How often have you felt nervous and stressed due to graduate school?” Scores are reversed on four positive items and then all scores are summed, producing a possible range of scores from 0 to 40. Higher scores reflect higher perceived levels of academic stress. Coefficient alpha was .78 in the author’s original study (Cohen & Williamson, 1988), and the adaptation used by Sheu et al. produced a coefficient alpha of .81. In the current study, coefficient alpha for the scale was .84.

**Academic satisfaction.** Academic satisfaction was assessed with a 7-item measure developed for prior research (Lent et al., 2005). These items assess the extent to which the participant is satisfied with various aspects of their experiences within the academic domain. Items were adapted to reflect the graduate school context. Participants rate their agreement with statements reflecting aspects of their program on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item is, “I feel satisfied with the decision to attend my graduate program.” Scores on items are summed and averaged, producing an overall score ranging from 1 to 5. Higher scores indicate greater levels of satisfaction with academic experiences. Coefficient alphas in the original studies were .86 and .87. The internal consistency estimate in the current study was .88.

**Satisfaction with Life Scale** (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). The SWLS is a 5-item scale used to assess cognitive evaluation of overall life satisfaction. Participants rate their agreement with statements regarding satisfaction with
life as a whole. Statements are rated on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). An example item is, “In most ways my life is close to my ideal.” Scores are summed, resulting in overall scores from 7 to 35, with higher scores reflecting greater satisfaction with life as a whole. Coefficient alpha in the initial validation study was .87. In the current study, the coefficient alpha was .90.

**Research Design**

Structural equation modeling (SEM) was used to test the fit of the measurement model and hypothesized structural models. Statistical software IBM SPSS AMOS Version 26 (Arbuckle, 2019) was employed to estimate models using the maximum likelihood (ML) method. Based on best practices in SEM recommended by Kline (2015), the fit indices that were used in order to examine the fit of the hypothesized structural models were the Bentler Comparative Fit Index (CFI), the Steiger–Lind Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Guidelines for evaluating fit indices have suggested that values of CFI ≥ .95, RMSEA ≤ .06, and SRMR ≤ .05 indicate a good fit of the model to the data, and values of CFI ≥ .90, RMSEA ≤ .08, and SRMR ≤ .08 indicate an adequate fit to the data (Hooper, Coughlan, & Mullen, 2008).

To reduce the number of parameters to be estimated in the model, latent variables were created for all constructs. Prior research suggested that the constructs of positive affect, psychological flexibility, outcome expectations, goal progress, academic stress, academic satisfaction, and life satisfaction exhibit unidimensional factor structures (Watson et al., 1988, Bond et al., 2011, Lent et al., 2005, Cohen & Williamson, 1988, Diener et al., 1985). The three subscales of the Advisory Working Alliance Inventory
were used as indicators of the environmental supports latent variable, and the two subscales of the academic self-efficacy measure were used as indicators of the academic self-efficacy latent variable. Item parcels were constructed to serve as indicators for the remaining latent variables. Exploratory factor analyses using the maximum likelihood method and a single factor solution were conducted for the unidimensional constructs. Individual items were assigned to parcels based on the item-to-construct balance method detailed in Little, Cunningham, Shahar, and Widaman (2002). This approach involves balancing items with low and high factor loadings within each item parcel in order to replicate the factor structure of the construct as closely as possible (Little, Rhemtulla, Gibson, & Schoemann, 2013). The constructs of positive affect, outcome expectations, and academic stress were represented by three item parcels of 3-4 items each, the constructs of psychological flexibility, goal progress, and academic satisfaction were represented by two item parcels of 3-4 items each, and the construct of life satisfaction was represented by two item parcels of 2-3 items each.

Following construction of the item parcels, confirmatory factor analysis (CFA) was conducted to ensure that all parcels loaded significantly onto their respective factors and that the measurement model provided an adequate fit the data.

The hypothesized structural model with paths suggested by Lent (2004) as well as the additional paths suggested in the present study was tested. An alternative model with paths from psychological flexibility fixed to zero was also tested in order to assess the unique contribution of the variable of psychological flexibility. The models were compared via the chi-square difference test and the ΔCFI > .01 criterion. The chi-square difference test provides a means of testing if there is a statistically significant difference
between the fit of two models, while the ΔCFI criterion provides a means of assessing whether the difference in fit between the two models is one of meaningful significance (Cheung & Rensvold, 2002).

Finally, moderation analyses examining the effect of psychological flexibility on the relationship between academic stress and academic satisfaction, and academic stress and life satisfaction were conducted. Indicators for the latent variable interaction terms were constructed using the residual centering approach outlined by Little, Bovaird, and Widaman (2006) along with guidance from Steinmetz, Davidov, and Schmidt (2011). Interactions were modeled in AMOS and paths from the interaction term to academic satisfaction and life satisfaction were examined, with significant paths indicating the presence of moderation.
Chapter Four

Results

Preliminary Analyses

Data Screening. A total of 346 participants responded to the survey. Survey response data was downloaded from the Qualtrics website as a comma separated values (.csv) file. This file was loaded into IBM SPSS Statistics Version 26 (IBM Corporation, 2019) and visually inspected for patterns of missing values. Thirty-six cases were identified where it appeared that participant attrition occurred. In all 36 cases, the sections of missing data began after the end of a particular measure, after which there were no further responses. This suggests that participants stopped responding to the survey after reaching a new screen on the website, as Qualtrics presents each survey measure on a separate screen, advancing to the next measure once the previous measure has been completed. All cases were missing responses to several measures, and often the majority of the survey, so it was decided to delete them from the dataset rather than attempt to impute missing data.

Little’s test was not significant ($\chi^2 = 547.69, p > .05$), indicating that any remaining missing values were missing completely at random (MCAR). Examination of the missing values demonstrated that there were six missing values across five participants, representing .02% of the total data. Due to this low percentage of missing
data, the expectation maximization function of SPSS was used to impute the missing values (Schlomer, Bauman, & Card, 2010).

Data were then screened for univariate and multivariate normality. Examination of z-scores indicated that seven cases had z-scores above the critical value of 3.29. Two multivariate outliers were identified that demonstrated Mahalanobis distances that exceeded the critical value of $\chi^2 = 27.88$. These nine cases were deleted from the dataset leaving a final sample size of $N = 301$. Indices of skewness and kurtosis were calculated for the study variables. Examination of these statistics suggested that there was no presence of problematic skewness or kurtosis according to the absolute value criteria of skewness $<3$ and kurtosis $<8$ presented in Kline (2015). Data met the assumptions of linearity and homoscedasticity. Tolerance and variation inflation factor (VIF) values were inspected and this revealed that assumptions of collinearity were also met. All main study variables were correlated at the $p < .05$ level or below, and means, standard deviations, and correlations are reported in Table 1. Based on these results, it was determined that the data met all assumptions for the use of SEM with maximum likelihood (ML) estimation and analyses proceeded.
Table 1

Means, Standard Deviations, and Correlations Among Variables

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<tr>
<th>Variable</th>
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<th>6</th>
<th>7</th>
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<tr>
<td>1. Positive Affect</td>
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<td>.15</td>
<td>.43</td>
<td>.39</td>
<td>.44</td>
<td>-.37</td>
<td>.41</td>
<td>.50</td>
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<tr>
<td>2. Psychological Flexibility</td>
<td>.19</td>
<td>.44</td>
<td>.28</td>
<td>.43</td>
<td>-.49</td>
<td>.31</td>
<td>.53</td>
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<td></td>
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<tr>
<td>3. Advising Relationship</td>
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<td>.13</td>
<td>.22</td>
<td>-.37</td>
<td>.45</td>
<td>.29</td>
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<tr>
<td>4. Academic Self-Efficacy</td>
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<td>.56</td>
<td>-.42</td>
<td>.27</td>
<td>.39</td>
<td></td>
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<tr>
<td>5. Academic Outcome Expectations</td>
<td>.38</td>
<td>-.23</td>
<td>.47</td>
<td>.39</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>6. Academic Goal Progress</td>
<td>-.49</td>
<td>.39</td>
<td>.44</td>
<td></td>
<td></td>
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<tr>
<td>7. Academic Stress</td>
<td>-.50</td>
<td>-.46</td>
<td></td>
<td></td>
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<tr>
<td>8. Academic Satisfaction</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>9. Life Satisfaction</td>
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</tbody>
</table>

|M | 3.36 | 5.14 | 3.71 | 6.93 | 7.57 | 4.30 | 2.84 | 4.04 | 4.86 |
|SD| 0.62 | 1.05 | 0.79 | 1.23 | 0.97 | 0.58 | 0.60 | 0.70 | 1.36 |

Note. All correlations are statistically significant at the \( p < .05 \) level or below.

Primary Analyses

Measurement model. Prior to testing the hypothesized model, the measurement model was tested to ensure that the indicators of the latent variables adequately loaded on their respective factors. The results of a confirmatory factor analysis revealed close model-to-data fit (\( \chi^2(173) = 299.93, p < .001; \) CFI = .97; RMSEA = .05 [90% CI = .04, .06]; SRMR = .04). Furthermore, all indicators significantly loaded onto latent variables. The means, standard deviations, and factor loadings are presented in Table 2.
Table 2

Means, Standard Deviations, and Factor Loadings of Observed Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>Score Range</th>
<th>Factor Loading</th>
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<tr>
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<td></td>
</tr>
<tr>
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<td>1.10</td>
<td>1.33 - 7.00</td>
<td>.84</td>
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<tr>
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<td>1.50 - 7.00</td>
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<td>Advising Relationship</td>
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<tr>
<td>Rapport</td>
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<td>1.36 - 5.00</td>
<td>.95</td>
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<tr>
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<td>.89</td>
<td>1.14 - 5.00</td>
<td>.81</td>
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<tr>
<td>Identification / Individuation</td>
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<td>1.00 - 5.00</td>
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<td>0.00 - 9.00</td>
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<td>Academic Outcome Expectations</td>
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<tr>
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<td>1.09</td>
<td>4.00 - 9.00</td>
<td>.87</td>
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<td>.72</td>
<td>1.67 - 5.00</td>
<td>.89</td>
</tr>
<tr>
<td>Parcel 2</td>
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<td>.73</td>
<td>1.50 - 5.00</td>
<td>.96</td>
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<td>Life Satisfaction</td>
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<td></td>
</tr>
<tr>
<td>Parcel 1</td>
<td>5.03</td>
<td>1.39</td>
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<td>4.75</td>
<td>1.44</td>
<td>1.00 - 7.00</td>
<td>.93</td>
</tr>
</tbody>
</table>

Note. All factor loadings are statistically significant at the $p < .001$ level.
**Structural model.** Finally, the hypothesized structural model was tested with all paths suggested by Lent’s (2004) original model as well as the additional paths hypothesized in the current study. Results suggested this model provided a good fit to the data ($\chi^2(180) = 307.09, p < .001; \text{CFI} = .97; \text{RMSEA} = .05 [90\% \text{ CI} = .04, .06]; \text{SRMR} = .04$). Out of the 28 paths between study variables, only 14 were significant. Positive affect significantly predicted academic self-efficacy ($\beta = .42, p < .001$), academic satisfaction ($\beta = .22, p = .001$), and life satisfaction ($\beta = .19, p = .002$), and did not significantly predict the advisory relationship ($\beta = .08, p = .267$) or academic stress ($\beta = -.03, p = .672$). Psychological flexibility significantly predicted the advisory relationship ($\beta = .19, p = .008$), academic self-efficacy ($\beta = .32, p < .001$), academic stress ($\beta = -.33, p < .001$), and life satisfaction ($\beta = .29, p < .001$), and did not significantly predict academic satisfaction ($\beta = -.05, p = .469$). The advisory relationship significantly predicted academic stress ($\beta = -.26, p < .001$) and academic satisfaction ($\beta = .30, p < .001$), and did not significantly predict academic self-efficacy ($\beta = .13, p = .061$), academic outcome expectations ($\beta = -.01, p = .940$), or academic goal progress ($\beta = .05, p = .427$). Academic self-efficacy significantly predicted academic outcome expectations ($\beta = .58, p < .001$) and academic goal progress ($\beta = .89, p < .001$), and did not significantly predict academic stress ($\beta = -.19, p = .428$) or academic satisfaction ($\beta = -.47, p = .059$). Academic outcome expectations significantly predicted academic satisfaction ($\beta = .47, p < .001$), and did not significantly predict academic goal progress ($\beta = -.08, p = .289$) or academic stress ($\beta = .10, p = .222$). Academic goal progress did not significantly predict any of the hypothesized relationships, which were academic stress ($\beta = -.20, p = .246$),
academic satisfaction ($\beta = .23, p = .200$), and life satisfaction ($\beta = .09, p = .165$).

Academic stress significantly predicted academic satisfaction ($\beta = -.40, p < .001$), and did not significantly predict life satisfaction ($\beta = -.02, p = .756$). Finally, academic satisfaction significantly predicted life satisfaction ($\beta = .35, p < .001$). The model accounted for 51% of the variance in academic stress, 59% of the variance in academic satisfaction, and 53% of the variance in life satisfaction. The model, with only significant paths shown, is presented in Figure 3. The model with all paths shown is presented in Figure 4.

![Figure 3: Results of the final structural model. To simplify the figure, only significant paths ($p < .01$) are depicted.](image-url)
In order to assess the contribution of psychological flexibility to explaining domain and life satisfaction, an alternative model with paths from psychological flexibility fixed to zero was tested. Fit statistics for this alternative model suggested a less close fit to the data, although still adequate to good ($\chi^2(185) = 388.31, p < .001; \text{CFI} = .95; \text{RMSEA} = .06 [90\% \text{CI} = .05, .07]; \text{SRMR} = .07$). The chi-square difference test between the two models was significant, $\Delta \chi^2(5) = 81.22, p < .001$, and the $\Delta \text{CFI} > .01$, suggesting that the difference between the two models was both statistically significant as well as practically significant. The alternative model accounted for 46% of the variance in academic stress, 59% of the variance in academic satisfaction, and 49% of the variance in life satisfaction.
Moderation analyses were conducted to test the hypotheses that psychological flexibility would moderate the relationship between academic stress and academic satisfaction, and academic stress and life satisfaction. The parameters from the interaction term to academic satisfaction and life satisfaction were both nonsignificant, suggesting that psychological flexibility did not have a moderating effect on the relationship between academic stress and academic satisfaction, or the relationship between academic stress and life satisfaction.
Chapter Five

Discussion

This study employed Lent’s (2004) social cognitive model of well-being to explore the role of psychological flexibility in predicting stress and well-being among graduate students in the United States. This study was the first to test Lent’s model with a graduate student sample, and is also the first to incorporate psychological flexibility as a person variable within the model. This study also extends the literature on graduate student mental health in general, and on academic stress, academic satisfaction, and life satisfaction among graduate students in particular.

The hypotheses of the study received mixed support. The hypothesized model demonstrated good fit to the data, which supports the first hypothesis. However, half of the paths estimated in the model were nonsignificant. While testing the significance of the relationships in the model was not an explicit aim of the first hypothesis, these results were unexpected. Despite this, the model accounted for proportions of variance in domain and life satisfaction that were consistent with existing tests of the Lent (2004) model of well-being (e.g. Garriott et al., 2015; Sheu, Mejia, Rigali-Oiler, Primé, & Chong, 2016; Sheu et al., 2014). Taken together, this provides initial evidence for the utility of Lent’s model in predicting well-being outcomes among postbaccalaureate students.
In Lent’s original model, traits and dispositions are thought to predict perceptions of environmental support. In the current study, traits and dispositions were operationalized as positive affect and psychological flexibility, and environmental supports as the advising relationship. The findings of the current study provided only weak support for this hypothesized pathway. Positive affect did not significantly predict the advising relationship, and while psychological flexibility did significantly predict the advising relationship, the magnitude of the association was rather small. In fact, the amount of variance in the advising relationship accounted for by the model was by far the lowest of any of the study variables.

This finding is at odds with the majority of the literature testing the Lent model which found significant paths between affective traits and dispositions and environmental supports (e.g. Işık, Ulubey, & Kozan, 2018; Lent, do Céu Taveira, Cristiane, Sheu, & Pinto, 2018; Garriott et al., 2015; Lent et al., 2005). One possibility for this finding is provided by Lent et al. (2009), in which a longitudinal design was used. In that study, positive affect at time one was not predictive of environmental supports at time two, rather environmental supports at time one were predictive of positive affect at time two. This longitudinal “autoregressive” effect was replicated in two further studies by Lent, do Céu Taveira, and Lobo (2012). So, the insignificant path in the current study may be due to the weakness of cross-sectional designs to detect these more nuanced relationships.

There is conceptual support for this explanation as well. As mentioned in Chapter Two, the concept of nurturing (i.e. supportive) environments proposed by Biglan et al. (2012) are hypothesized to promote psychological flexibility and well-being. This idea also suggests a bidirectional path between personality traits and dispositions and
environmental supports. The original proposal for the current study included a hypothesis to test this bidirectional path, but the hypothesis had to be dropped due to insufficiency of the research design to explore the question. Since the concept of nurturing environments has not been empirically tested to date, and there appears to be support for the basic relationships in literature regarding the Lent model, this suggests intriguing possibilities for future research.

A further explanation may be that factors that would have been predictive of the advising relationship were simply not a part of the model in the current study, or were not measured in a way that would have allowed prediction. In one study that examined factors leading to satisfaction with the advising relationship, social/emotional support was cited by participants as crucial (Tenenbaum, Crosby, & Gliner, 2001). This was measured as part of the advising relationship in the current study, which would make the predictor and the outcome the same variable. Other studies have suggested that advisee attachment styles and methods of advisor selection are predictive of the quality of the relationship, both of which were not measured in the current study (e.g. Huber, Sauer, Mrdjenovich, & Gugiu, 2010).

Another somewhat unexpected set of findings in the current study was that environmental supports did not significantly predict self-efficacy, outcome expectations, or goal progress. Of these findings, the nonsignificant relationship between supports and self-efficacy is the most at odds with prior research. Only one other study of the Lent model found a nonsignificant path between support and self-efficacy (Singley, Lent, & Sheu, 2010). Interestingly, that study also utilized a longitudinal, rather than a cross-sectional design. In that study, self-efficacy at time one was the greatest predictor of self-
efficacy at time two, and goal progress was the only other significant predictor. The authors speculated that “personal performance accomplishments…tend to serve as a more potent source of efficacy information than do less direct sources, like social support.” (p. 142).

For the current study, it may be that graduate students have a relatively high and restricted range of academic self-efficacy, which would not be surprising given that prior academic success is generally a requirement to gain admission to graduate education. In the current study, scores on the academic milestone subscale of the academic self-efficacy measure are consistent with this possibility ($M = 8.07$, $SD = 1.37$, $Mode = 9.00$, $Range = 0.00$ to $9.00$). In fact, 44% of the participants endorsed the highest possible score on this subscale. This may have reduced the ability of the statistical tests to predict variance on this variable.

Conceptually, it could also be the case that for graduate students, the advising relationship is less important as a source of self-efficacy. In other words, they already believe in their abilities, and they may value the advising relationship for other reasons, such as the guidance they receive in how to deploy those abilities.

Another aspect complicating the results with respect to the paths from supports may have been measurement issues. The measure of the advising relationship used in the current study was constructed with, and normed on, counseling psychology doctoral students (Schlosser & Gelso, 2001). Recall that nearly 28% of the participants in the current study were obtaining master’s or professional degrees. Preliminary analyses did not demonstrate significant differences on this measure between participants in differing degree programs. However, it must be recognized that the functions and relationships that
advisors have in different programs and at different degree levels can vary greatly. Thus the measure used in this study may have failed to capture aspects of support that would have supported the paths hypothesized in the original Lent model.

The nonsignificant paths from supports to outcome expectations and goal progress are less surprising in the light of prior research. In several prior tests of Lent’s model, the variable of outcome expectations has been purposefully omitted due to inconsistent support for its relationships with other variables in the model (e.g. Lent et al., 2005; Lent et al., 2007; Lent et al., 2017). While goal progress has typically been retained in prior tests of the Lent model, several studies have not supported a significant path from supports to goal progress (e.g. Ojeda et al., 2011; Garriott et al., 2015; Lent et al., 2018).

Nonsignificant paths from self-efficacy to domain-specific stress and satisfaction were contrary to expectations in the current study, however prior research has also demonstrated inconsistent support for this relationship (Singley et al., 2010; Hui, Lent, & Miller, 2013; Lent et al., 2014; Garriott et al., 2015). Measurement issues may also have contributed to the lack of support for these paths. The measure used in the current study was adapted from a measure that has previously been used only with undergraduate students. It may be that the measure used, even in adapted form, did not capture the aspects of self-efficacy that would have been relevant to domain-specific stress and satisfaction in the graduate student context.

Inconsistent support for paths from goal progress to domain satisfaction and life satisfaction has also characterized the literature on the Lent model (Lent et al., 2009; Lent et al., 2014; Garriott et al., 2015; Lent et al., 2017; Lent et al., 2018). In the current study the lack of significant paths was more surprising, given that academic goal progress was
strongly predicted by academic self-efficacy, and that more variance in academic goal progress was accounted for in the current study than any other variable.

It may be that for graduate students in the current sample, goal progress is a “given,” particularly when considering the high academic milestone self-efficacy scores. This idea is supported by the scores on goal progress as well ($M = 4.30, SD = 0.58, Mode = 5.00, Range = 2.14$ to $5.00$). If academic goal progress is seen this way, it may have relatively little effect on evaluations of satisfaction and stress. This score distribution may also have been a result of the measure used. The measure of goal progress used was also one that was adapted from a measure previously used only with undergraduates. The items are rather general in the goals that are described, and this may have failed to capture the more specific or complicated goals that are involved in graduate study.

While academic outcome expectations did not demonstrate expected significant relationships with academic goal progress or with academic stress, this variable did significantly predict academic satisfaction. The prominence of outcome expectations in the current study may be surprising given that this variable has been the most inconsistently supported and most often omitted from the model in prior research. A clue to the possible contextual importance of outcome expectations comes from the report from the Berkeley Graduate Assembly report on graduate student well-being (2014). In that survey, the number one predictor of both graduate student well-being and depression was “career prospects.” Students who perceived poor career prospects (i.e. outcome expectations) were more likely to be depressed and less satisfied with their academic programs, while those who perceived good career prospects enjoyed opposite outcomes.
Positive affect did not yield a significant path to academic stress in the current study. In prior research which included academic stress in the model, the support for this pathway has been inconsistent. Lent et al. (2009) found that positive affect did not predict academic adjustment (a construct that included both academic satisfaction and stress facets). In replications of the 2009 studies, Lent et al. found positive affect predicted academic adjustment in one study, but not in another (2012).

In the current study, positive affect did demonstrate a positive, significant relationship with academic satisfaction, as well as with life satisfaction, both of which were expected. However, the relationships were modest. Taken together, the current findings along with prior research suggest that the relationship of positive affect to domain-specific aspects of stress and satisfaction may be more complicated and contextually sensitive than Lent’s original theory proposed. Lent et al. conjectured in the 2012 longitudinal replication studies mentioned above, that positive affect may be more usefully conceptualized as an indicator, not merely a predictor, of satisfaction outcomes. That is, positive affect would be influenced by changes in satisfaction, and could be responsive to other factors within the model, and not solely be an exogenous factor. However, this relationship would not be well examined in a cross-sectional study.

Academic stress in the current study did not significantly predict life satisfaction. Most prior research with the Lent model which examined this relationship found significant paths between the variables (Lent et al., 2012; Sheu et al., 2014). However, in one of the studies from Lent et al. (2012), academic stress was not predictive of life satisfaction in a longitudinal design. Given the small amount of research that has been performed on the relationship between academic stress and life satisfaction within the
context of the Lent model, it can only be speculated as to why the expected relationship was not demonstrated in the current study. One possibility is that the effect of stress is mediated through its relationship with academic satisfaction, and mediation effects were not examined in the current study. Another possibility is that students in the current sample perceive compartmentalize academic stress and take it into account when evaluating their satisfaction with their academic program, but not when evaluating their life as a whole.

The other paths in the study were all significant and the relationships were in the expected directions. Overall life satisfaction was predicted by academic satisfaction, psychological flexibility, and positive affect. Academic satisfaction was predicted by outcome expectations, academic stress (in the negative direction), the advising relationship, and positive affect. The two predictors of academic stress were psychological flexibility and the advising relationship, both of which had a negative relationship with stress. The sole predictor of academic goal progress was academic self-efficacy, and this was also the strongest relationship in the current study. Academic outcome expectations were also solely predicted by academic self-efficacy. Academic self-efficacy was predicted by positive affect and psychological flexibility. As mentioned above, the advising relationship was predicted by psychological flexibility, and this relationship accounted for the least amount of variance in the model.

The second hypothesis, that a model including psychological flexibility would demonstrate a better fit to the data and explain more variance in domain and life satisfaction, was supported. While the differences in fit and variance explained between the models were small, tests of statistical and practical significance suggested that the
differences were meaningful. This lends support to the notion that when attempting to understand the well-being of graduate students, the presence and frequency of positive emotions is not the full story. The ability to experience the full range of emotions, positive and negative, while also choosing to act in accord with one’s values, contributes to a fuller accounting of graduate student well-being. This points to the idea that the value of the graduate school experience is found in its ability to promote what is meaningful to the graduate student, not simply to produce positive feelings.

The third hypothesis – that psychological flexibility would significantly predict academic stress, academic satisfaction, and life satisfaction, was partially supported. Psychological flexibility significantly predicted academic stress in a negative direction, and significantly predicted life satisfaction in a positive direction. However, psychological flexibility did not significantly predict academic satisfaction.

While this finding did not support the third hypothesis, it is consistent with prior research examining the relationship between psychological flexibility and domain-specific satisfaction. As mentioned in Chapter Two, studies focusing on psychological flexibility in the workplace failed to show a significant association between psychological flexibility and job satisfaction. Bond, Lloyd, and Guenole (2013), speculated that since psychological flexibility is thought to be responsive to context, general measures of psychological flexibility may fail to capture the context-sensitive facets that would reveal significant relationships in domain-specific contexts. This concept was born out in the current study, where a general measure of psychological flexibility demonstrated a significant relationship with overall life satisfaction, but not with the domain-specific measure of academic satisfaction.
The significant relationship between psychological flexibility and academic stress complicates this explanation. The current study employed a domain-specific measure of academic stress. If the general measure of psychological flexibility fails to be sensitive to context, then it could be expected that the current study would not have found a significant relationship with any domain-specific measure, including stress. One explanation for this discrepancy could be that for graduate students, academic stress is the most salient stressor in their lives, and thus a general measure of psychological flexibility would be able to successfully capture aspects that are relevant to coping with stress in general. This notion is supported by the Brownson et al. (2016) study mentioned earlier, in which “academics” was the most frequently endorsed stressor among graduate students.

The fourth hypothesis, that psychological flexibility would moderate the relationships between academic stress and academic satisfaction, and academic stress and life satisfaction, was not supported. As with the third hypothesis, it may be that using a measure of general psychological flexibility instead of a domain-specific measure resulted in an inability of the current study to capture the ways in which psychological flexibility would buffer the effect of domain-specific stress. On the other hand, psychological flexibility did demonstrate a significant negative relationship with academic stress. It may be that psychological flexibility does have an effect on academic satisfaction, which is mediated by its effect on academic stress, although mediation effects were not a focus of the current study.
Implications for Practice

The results of the current study suggest possible avenues for institutions of higher education to address concerns regarding stress and well-being among graduate students. The findings highlight the important role that positive affect, psychological flexibility, the advisory relationship, and positive outcome expectations have in predicting academic satisfaction, academic stress, and life satisfaction among the current graduate student sample. These factors are all amenable to change, and interventions that affect both personal and institutional influences are quite possible.

The title of this study contains an implicit question. After examining the findings, what can be said about the role of psychological flexibility in graduate student stress and well-being? In short, psychological flexibility leads students to feel confident in their ability to achieve and persist in the face of challenges, to perceive that they are not overwhelmed by the demands of their academic programs, and to enjoy greater overall satisfaction with their lives. As stated at the beginning of this document, despite rising rates of stress and mental health concerns among graduate students, the structure and demands of graduate school are not likely to change. The results of the current study lend support to the notion that interventions that improve psychological flexibility would likely be beneficial in buffering the effects of stress and improving the overall well-being of graduate students within the current academic context.

The question may be raised at this point – why would promoting psychological flexibility be more appropriate for graduate students rather than promotion of other constructs such as emotion regulation, resilience, or grit? While psychological flexibility
shares conceptual overlap with these constructs, it has particular features which may make it suitable for addressing difficulties in the graduate student experience.

Emotion regulation refers to the ways in which people attempt to “influence which emotions they have, when they have them, and how they experience and express these emotions” (Gross, 1999, p. 557). Thus, the concept of emotion regulation encompasses the full range of strategies that people use to influence their emotional experience. This can include strategies such as mindfulness to take a curious, nonjudgmental perspective on one’s emotions, or avoidance, suppression, and distraction to remove emotions from one’s awareness (Gross, 1999). Psychological flexibility may be a more adaptive construct with graduate students for two reasons. One, psychological flexibility incorporates certain emotion regulation strategies such as mindfulness and acceptance that have demonstrated beneficial outcomes (e.g. Vøllestad, Nielsen, & Nielsen, 2012) while being incompatible with emotion regulation strategies that have demonstrated harmful outcomes (e.g. Gross & John, 2003). Second, psychological flexibility emphasizes the ways that people respond to a range of experiences, such as thoughts, memories, and situational demands, in addition to emotions.

The construct of resilience may also seem relevant to the current discussion, as it involves “positive adaptation within the context of significant adversity” (Luthar, Cicchetti, Becker, 2000, p. 543). Historically, the construct of resilience has been concerned with individuals who have been exposed to severe or traumatic circumstances (2000). While some graduate students may experience stress as traumatic, academic difficulties are typically less severe, even if highly aversive. Thus, psychological flexibility may be a better construct to measure than resilience when examining graduate
student responses to stress. Conceptually, psychological flexibility has been seen as a factor that contributes to resilience (e.g. Pakenham, Mawdsley, Brown, & Burton, 2018). Thus, when resilience is conceptualized as simply the capacity to have positive outcomes in the face of adversity, psychological flexibility can be seen as an important factor, albeit not the only factor, in the resilience of graduate students.

When it comes to grit, there are important differences with the construct of psychological flexibility. Grit is defined as “perseverance and passion for long-term goals” (Duckworth, Peterson, Matthews, & Kelly, 2007). A critical difference is that psychological flexibility involves acceptance of emotions in general, rather than the presence or cultivation of particular emotions. In contrast, grit involves the presence of the emotion of passion. Psychological flexibility may be a more apt construct for promoting well-being among graduate students because it involves persistence in the context of any emotional state, including when passion isn’t present. Grit is also defined by stability in goals (Duckworth et al., 2007). While psychological flexibility has been associated with progress towards goals, it also allows for goals to change if a person’s situation or values call for it. This may be important in the graduate student context as students encountering difficulty may face the prospect of changing research trajectories, advisors or mentors, and even programs of study. This also allows for the growth and transformation that was cited as crucial in the qualitative data obtained during the class project that helped inspire the current study (Hudyma & Mossman, 2014).

With an eye on promoting psychological flexibility, the most obvious implication is that Acceptance and Commitment Therapy (ACT) would likely be an effective intervention strategy for university counseling centers to employ when providing
treatment to presenting graduate students. The concept of psychological flexibility was
developed within the ACT research tradition, and ACT itself is designed with the goal of
cultivating psychological flexibility (Hayes et al., 2011). Within the current study,
psychological flexibility had a greater influence on academic stress and life satisfaction
than positive affect, which suggests that it may be more effective in addressing the
deleterious effects of academic stress than therapeutic interventions which aim to
increase positive affect and reduce negative affect.

Interventions to foster psychological flexibility need not be limited to face-to-face
therapeutic settings. Trials of ACT-based online self-help programs have demonstrated
positive effects on rates of depression and anxiety (Pots et al., 2016; Levin, Pistorello,
Seeley, & Hayes, 2014). ACT-based prevention programs provided to underserved
college students (Sandoz, Kellum, & Wilson, 2017) and first-year college students
(Danitz & Orsillo, 2014) demonstrated beneficial effects on academic performance and
graduation rates, and psychological flexibility and depressive symptoms, respectively.
Self-help programs could be adapted for the graduate student context and prevention
programs could be incorporated as part of orientation program, ongoing seminars, and
student support activities. Such efforts would also serve to advance Lent’s (2004) aim of
restimulating the counseling psychology value of promoting wellness and development
for all people across their lifespan, not only ameliorating acute dysfunction.

Aside from psychological flexibility, factors important to graduate student well-
being in general were highlighted. The current study extends the literature supporting the
importance of quality advising relationships within the graduate student context. The
advisory relationship directly improved academic satisfaction and reduced perceived
stress. In fact, the only predictors of academic stress in the current study were the advisory relationship and psychological flexibility. This underscores the importance of both aspects for addressing the impact of stress on graduate students. Most, if not all, graduate programs already include an advising component. Institutions seeking to prevent mental health concerns and to promote wellness among their students could take steps to ensure high quality advising to all graduate students.

A relatively unexpected finding of the current study was the importance of outcome expectations in predicting academic satisfaction. In fact, outcome expectations were the strongest predictor of academic satisfaction. This suggests that a key aspect of a student’s academic well-being is dependent on their perception that their education will lead to work that is rewarding, whether in terms of compensation, prestige, or personal meaning. Institutions and programs could facilitate this by structural initiatives to connect graduates with jobs in their fields and communities, through professional networks and institutional relationships. Student debt can also negatively impact outcome expectations (Olson-Garriott, Garriott, Rigali-Oiler, & Chao, 2014). Programmatic initiatives to reduce the financial demands of graduate school could positively influence outcome expectations and thus reduce stress and improve academic satisfaction.

Limitations and Implications for Future Research

While this study lends support to the usefulness of Lent’s model for understanding the well-being of graduate students, and it extends the neglected literature on graduate student mental health, several limitations must be acknowledged. The diversity of the participants in the sample was limited, with most respondents identifying as female and White. While the overall population of enrolled postbaccalaureate students
in the United States is majority female (59%) and White (63%) (NCES, 2019), these groups are still overrepresented in the current sample, with 85% identifying as female and 74% identifying as White. This limits the generalizability of the findings to the actual student population.

A cross-sectional design was used in this study, which prevents conclusions about causality and temporal ordering among the variables. As demonstrated by the longitudinal designs used in Lent et al., (2009) and Lent et al., (2012), relationships among the variables in Lent’s model of well-being differ markedly when examined over time, and further nuance and complexity is revealed. Kashdan and Rottenberg (2010) in their impressive overview of the construct of psychological flexibility, explicitly call for more longitudinal designs in examining flexibility, as cross-sectional designs cannot capture the contextual fluctuations in psychological flexibility, as well as relevant antecedents, correlates, and consequences. Thus, the current study, while providing initial support for exploring the role of psychological flexibility in graduate student mental health, is limited in what it reveals about the complexity of the interactions among variables of interest.

Since the measures for the current study were administered online to a convenience sample who self-selected to participate, random selection was not possible, and there is no way to know anything about characteristics of non-respondents. The sample is also heavily biased towards students in social and behavioral sciences, which further limits the generalizability to the larger graduate student population.

Measurement issues were also suggested by the results and prior research. While the measures used in the Lent et al. (2005) study have a good track record in research
with the Lent model, they have previously been employed in research on undergraduate students only. It is possible that items are failing to capture aspects of the academic experience that are more relevant to graduate students. Future research would also benefit from utilizing a more context or domain-specific measure of psychological flexibility, which could improve the ability of the analyses to estimate relationships with domain-specific variables.

Mediation hypotheses were not examined in the current study, and prior research with the Lent model has demonstrated a range of full and partial mediation effects, which add nuance to the relationships among variables of interest (e.g. Lent et al., 2018; Garriott et al., 2015). Given the large number of insignificant paths in the current study, an analysis of indirect effects could have filled in gaps in the hypothesized structural model.

Conclusion

In sum, the current study has added to the literature on graduate student mental health, particularly in suggesting factors that contribute to well-being and thriving even in the face of the stressful demands of graduate school. It has provided initial evidence for the utility of Lent’s (2004) unified model of well-being in examining the predictors of academic and life satisfaction among graduate students. This study has contributed to an understanding of the value that psychological flexibility and advisory relationships have in promoting well-being and reducing the impact of stress among graduate students. Finally, the findings suggest implications for effective interventions to improve graduate student well-being, and suggest possibilities for future research to further understand the rich context of the graduate student experience.
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Appendices

Appendix A

Glossary of Terms

Advising. In graduate education, a student’s advisor is the faculty member responsible for guiding the student through the educational program. Advising typically involves providing advice and approval for educational plans, assisting with meeting institutional requirements, and overseeing thesis and dissertation projects. It may also encompass guidance relating to professional development and involvement with faculty research activity (Schlosser & Gelso, 2001).

Environmental supports. A person's environment provides opportunities and supports that influence interests and goals. One way that this occurs is through direct exposure to activities and experiences. Another is by vicarious exposure either by observing others or by hearing and seeing accounts of others. A person's environment provides support for certain activities to the extent that it provides examples and reinforcement for those activities (Lent, Brown, & Hackett, 1994).

Experiential avoidance. Also known as psychological inflexibility. The tendency to be unwilling to remain in contact with certain elements of one’s experience. Experiential avoidance becomes problematic when it interferes with engaging in behavior that is consistent with one’s values. A clear example is agoraphobia, when a person’s life becomes impoverished because they are unwilling to remain in contact with the anxiety of leaving their home.

Goals. "Goals refer to people’s determination to produce a particular outcome or to attain a particular level of performance." (Lent, 2004, p. 494). The current study
focuses on goals within the academic domain. This includes outcomes such as completion of a graduate program, or levels of performance such as passing examinations.

**Goal progress.** The extent to which a person perceives that their goal is more likely to occur as a result of their activities.

**Graduate student.** A person attending a postbaccalaureate (post bachelor’s degree) educational program. This includes programs which grant master’s degrees, doctorate degrees, and professional degrees.

**Outcome expectations.** Outcome expectations refer to a person’s beliefs about the consequences that will occur as a result of certain actions (Lent, 2004). The current study focuses on outcome expectations for the academic domain. This includes consequences such as obtaining a certain degree, or expectations about the kind of career to which one will have access.

**Psychological flexibility.** A set of dynamic processes that encompass the ability to be conscious of whatever is currently in one’s experience and to persist or change one’s behavior based on situational demands and one’s values. Psychological flexibility can be contrasted with experiential avoidance (Hayes, Strosahl, & Wilson, 2011; Kashdan & Rottenburg, 2010).

**Psychological well-being.** A six factor model of well-being developed by Carol Ryff, considered to be part of the eudaimonic tradition. In Ryff’s view, well-being consists in striving to realize one’s potential, specifically in the dimensions of self-acceptance, positive relations with others, personal growth, purpose in life, environmental mastery, and autonomy (Ryff, 1989).
**Satisfaction.** A cognitive evaluation or judgment about one's life, or an aspect/domain of one's life. Used by researchers in the subjective well-being tradition as a component of well-being, along with positive and negative affective reactions. When people evaluate their life in positive terms, they may be said to be satisfied with their life (Diener, 1984).

**Self-efficacy.** Expectations or beliefs that a person holds regarding their ability to successfully engage in certain kinds of behavior or to achieve certain outcomes (Lent, 2004).

**Stress.** The psychological response that occurs when an individual perceives that the demands placed on them challenge their capabilities and threaten their well-being (Lazarus & Folkman, 1984).

**Subjective Well-Being.** A conception of well-being promoted by Ed Diener and associates. SWB consists of cognitive evaluations or judgments regarding one's life, and relative frequency of the experience of positive and negative affect (Diener, 1984).

**Values.** Within the psychological flexibility literature, values refer to the reinforcing consequences of ongoing, dynamic patterns of behavior. As an example, if a student has a value of “doing well in my graduate program,” they can be expected to experience intrinsic reinforcement when they engage in activities that are likely to lead to results that can be evaluated as “having done well.” (Hayes, Strosahl, & Wilson, 2011).

**Well-being.** While there are many ways to conceptualize well-being, they generally refer to ideas about positive experience and functioning. Well-being is not simply the absence of disease and distress, it also implies the presence of pleasant experiences and engagement in personally meaningful activity (Ryan & Deci, 2001).
Appendix B

Demographic Questionnaire

Age: _____

Gender:
  o Female
  o Male

Ethnicity:
  o White
  o Black
  o Hispanic or Latino/a
  o Asian or Pacific Islander
  o Native American, Alaskan Native, or Native Hawaiian
  o Biracial or Multiracial
  o Other _____

What is the highest level of education you have completed?
  o Bachelor’s degree
  o Master’s degree
  o Professional degree (e.g. M.D., J.D., outside of your current graduate program)
  o Doctorate degree (e.g. Ph.D, Ed.D., outside of your current graduate program)

What degree are you seeking in your current graduate program?
  o Master’s degree
  o Doctorate degree
  o Professional degree

What is your current year in your graduate program?
  o 1st
  o 2nd
  o 3rd
  o 4th
  o 5th
  o 6th
  o 7th
  o 8th
  o 9th
  o 10+

What is your general field of study?
- Arts and Humanities
- Biological Sciences
- Business
- Education
- Engineering
- Math and Computer Science
- Physical and Earth Sciences
- Public Administration and Services
- Social and Behavioral Sciences
- Other _________
Appendix C

The Positive Affect subscale of the Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each item and then choose the appropriate answer next to that word. Indicate to what extent you generally feel that way.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Very slightly or not</td>
<td>A little</td>
<td>Moderately</td>
<td>Quite a bit</td>
<td>Extremely</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Very</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite a bit</th>
<th>Extremely</th>
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<tbody>
<tr>
<td></td>
<td>slightly</td>
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<td>Interested</td>
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<tr>
<td>Excited</td>
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</tr>
<tr>
<td>Strong</td>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Enthusiastic</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Proud</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>Alert</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>Inspired</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Determined</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Attentive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Active</td>
<td>1</td>
<td>2</td>
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</table>
Appendix D

Acceptance and Action Questionnaire-II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

<table>
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<tr>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never true</td>
<td>Very seldom true</td>
<td>Seldom true</td>
<td>Sometimes true</td>
<td>Frequently true</td>
<td>Almost always true</td>
<td>Always true</td>
</tr>
</tbody>
</table>

My painful experiences and memories make it difficult for me to live a life that I would value.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

I’m afraid of my feelings.

<p>| 1 | 2 | 3 | 4 | 5 | 6 | 7 |</p>
<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>I worry about not being able to control my worries and feelings.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>My painful memories prevent me from having a fulfilling life.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Emotions cause problems in my life.</td>
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</tr>
<tr>
<td>It seems like most people are handling their lives better than I am.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Worries get in the way</td>
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</tbody>
</table>
of my success.

| My painful experiences and memories make it difficult for me to live a life that I would value. |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
Appendix E

Advisory Working Alliance Inventory

These 30 items pertain to your perceptions about your relationship with your advisor. For the purposes of this study, the term advisor is referring to the faculty member that has the greatest responsibility for helping guide you through your graduate program (e.g. advisor, major professor, committee chair, dissertation chair). Please respond to the items using the following scale:

<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></td>
</tr>
</tbody>
</table>

1. I get the feeling that my advisor does not like me very much.

2. My advisor introduces me to professional activities (e.g. conferences, submitting articles for journal publication).

3. I do not want to be like my advisor.

4. My advisor welcomes my input into our discussions.

5. My advisor helps me conduct my work within a plan.

6. I tend to see things differently from my advisor.
<p>| | | | | | |</p>
<table>
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</thead>
<tbody>
<tr>
<td>7. My advisor does not encourage my input into our discussions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. My advisor has invited me to be a responsible collaborator in his/her own work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I do not want to feel similar to my advisor in the process of conducting work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. My advisor is not kind when commenting about my work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. My advisor helps me establish a timetable for the tasks of my graduate training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. My advisor and I have different interests.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>13. I do not feel respected by my advisor in our work together.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
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<tr>
<td>14. My advisor is available when I need her/him.</td>
<td>1</td>
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<tr>
<td>15. I feel like my advisor expects too much from me.</td>
<td>1</td>
<td>2</td>
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</tr>
<tr>
<td>16. My advisor offers me encouragement for my accomplishments.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>17. Meetings with my advisor are unproductive.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>18. I do not think that my advisor believes in me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>19. My advisor facilitates my professional development through networking.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>20. My advisor takes my ideas seriously.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>21. My advisor does not help me stay on track in our meetings.</td>
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<tr>
<td>22. I do not think that my advisor has my best interests in mind.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>23. I learn from my advisor by watching her/him.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. I feel uncomfortable working with my advisor.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25. I am an apprentice of my advisor.</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26. I am often intellectually “lost” during my meetings with my advisor.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27. I consistently implement suggestions made by my advisor.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28. My advisor strives to make program requirements as rewarding as possible.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29. My advisor does not educate me about the process of graduate school.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>30. My advisor helps me recognize areas where I can improve.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix F

Academic Self-Efficacy Scale

The following is a list of major steps along the way to completing a graduate degree. Please indicate how much confidence you have in your ability to complete each of these steps in relation to your graduate program. Use the 0-9 scale below to indicate your degree of confidence.

<table>
<thead>
<tr>
<th>How much confidence do you have in your ability to:</th>
<th>No Confidence At All</th>
<th>Some Confidence</th>
<th>Complete Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remain enrolled in your program over the next semester</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remain enrolled in your program over the next two semesters</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excel in your program over the next semester</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excel in your program over the next two semesters</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete the upper level required courses in</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Here we are interested in knowing how well you believe you could cope with each of the following barriers, or problems, that students could possibly face in pursuing a graduate degree. Please indicate your confidence in your ability to cope with, or solve, each of the following problem situations.

<table>
<thead>
<tr>
<th>How confident are you that you could:</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cope with a lack of support from professors or your advisor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete your degree despite financial pressures.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continue on in your program even if you did not feel well-liked by your classmates or professors.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Find ways to overcome communication problems with professors or instructors in your courses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balance the pressures of your program with the desire to have free time for fun and other activities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continue on in your program even if you felt that,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
socially, the environment in the program was not very welcoming to you.

Find ways to effectively meet the demands of your program despite having competing demands for your time.
### Appendix G

#### Academic Outcome Expectations Scale

*Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements.*

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Unsure</td>
<td>Agree</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graduating from my program will likely allow me to:</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Unsure</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>…receive a good job offer</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>…earn an attractive salary</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>…receive respect from other people</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>…do work that I would find satisfying</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>…increase my sense of self-worth</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>…have a career that is valued by my family</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>…do work that can “make a difference” in people’s lives</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>…go into a field with high employment demand</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...do exciting work</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>---------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>...have the right type and amount of contact with other people (i.e. “right” for me)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix H

Academic Goal Progress Scale

Rate each of the goal statements in terms of how much progress you are making toward each one at this point in time. That is, indicate how effectively you feel you are meeting or working toward each goal at present.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Progress At All</td>
<td>A Little Progress</td>
<td>Fair Progress</td>
<td>Good Progress</td>
<td>Excellent Progress</td>
</tr>
<tr>
<td>Excelling at your academic program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Completing all coursework requirements effectively</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Studying effectively for all your courses and exams</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Remaining in good standing within your program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Successfully completing the requirements of your</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Program that are outside of the classroom</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Receiving good evaluations from your professors and/or supervisors</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Mastering the knowledge and skills required by your program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Appendix I

Academic Stress Scale

The questions in this scale ask you about your feelings and thoughts regarding your graduate program. In each case, please indicate how often you felt or thought a certain way.

<table>
<thead>
<tr>
<th>( 0 )</th>
<th>( 1 )</th>
<th>( 2 )</th>
<th>( 3 )</th>
<th>( 4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Almost Never</td>
<td>Sometimes</td>
<td>Fairly Often</td>
<td>Very Often</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Fairly Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often have you been upset because of something that happened unexpectedly in your academic life?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>How often have you felt that you were unable to control the important things in your graduate program?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>How often have you felt nervous and “stressed” due to the demands of your graduate program?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Question</td>
<td>Scores</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often have you felt confident about your ability to handle your</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>academic problems?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often have you felt that things were going your way academically?</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often have you found that you could not cope with all the things</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>that you had to do academically?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often have you been able to control irritations in your academic</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>life?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often have you felt that you were on top of things in your graduate</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>program?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often have you been angered because of academic demands that were</td>
<td>0 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>outside your control?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How often have you felt academic difficulties were piling up so high that you could not overcome them?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
</table>

### Appendix J

**Academic Satisfaction Scale**

*Using the scale below, indicate your level of agreement with each of the following statements.*

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

<p>| I feel satisfied with the decision to enroll in my graduate program | 1 | 2 | 3 | 4 | 5 |
| I am comfortable with the atmosphere in my graduate program | 1 | 2 | 3 | 4 | 5 |
| For the most part, I am enjoying my coursework | 1 | 2 | 3 | 4 | 5 |
| I am generally satisfied with my academic life | 1 | 2 | 3 | 4 | 5 |
| I enjoy the level of intellectual | 1 | 2 | 3 | 4 | 5 |</p>
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>stimulation in my program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel enthusiastic about the field that I am studying</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I like how much I have been learning in my program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix K

Satisfaction With Life Scale

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Slightly disagree</td>
<td>Neither agree nor disagree</td>
<td>Slightly agree</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Slightly disagree</td>
<td>Neither agree nor disagree</td>
<td>Slightly agree</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Slightly disagree</td>
<td>Neither agree nor disagree</td>
<td>Slightly agree</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

In most ways my life is close to my ideal.

The conditions of my life are excellent.
<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am satisfied with my life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>So far I have gotten the important things I want in life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I could live my life over, I would change almost nothing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix L

AMOS Measurement Model Diagram

Figure 5: Measurement model diagram as represented in AMOS.
Appendix M

AMOS Structural Model Diagram

Figure 6: Structural model diagram as represented in AMOS.
Appendix N

AMOS Structural Model Diagram with Path Estimates

Figure 7: Structural model diagram with path estimates as represented in AMOS.