The Happiness Project: A Randomized Control Trial of an Online Positive Psychology Intervention for Graduate Students

by

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ABSTRACT

Positive psychology focuses on the promotion of well-being (Seligman, & Csikszentmihalyi, 2000). Positive psychology interventions (PPIs) have been developed to help facilitate the development of skills needed to flourish and current research suggests that PPIs can help individuals improve their happiness, reduce stress, and become more resilient (Lyubomirsky, King, & Diener, 2005). National surveys highlight that students in higher education are in dire need of interventions aimed at helping them cope with the negative impact of stress (Douce & Keeling, 2014; Marks & Wade, 2015). Research among the graduate student population is scant even though they report high levels of stress and work even more hours than undergraduate students (Wyatt & Oswalt, 2013). PPIs implemented in the graduate student population focus heavily on psychologically-based programs, like psychology and social work, whose students may already be receiving assistance in self-care (Botta, Cadet, & Maramaldi, 2015; Burkhart, 2014; Nelson, Dell'Oliver, Koch, & Buckler, 2001). Thus, this current study is a randomized controlled trial testing an online PPI, adapted from Achor's work in the business industry (2012, 2014), compared with an online informative stress group and a wait list control group among graduate students from various disciplines at a large, public university in the Southwest. Participants were administered pre-, post-, and three-month follow-up tests to determine the impact of the interventions on their levels of perceived stress, happiness, and resilience. A multivariate analysis of covariance (MANCOVA) was used with covariates of age, gender, race, program of study, and graduate level of study (masters versus doctoral). The main findings of the study included: the students in the PPI group reported significantly higher resilience at the end of the three weeks than

did the students in the informative stress or wait list control groups, even though measures of happiness or perceived stress were not impacted; and students from psychologically based programs received the most benefit from treatment, especially from the PPI intervention. All findings, implications, and suggestions for future directions are discussed.

DEDICATION

I dedicate this work to my family – both the family I have been gifted and the family I have chosen.

To my hubs - Patrick. You selflessly moved to another state, away from family and friends, to help me pursue my passion. Remember when we had boxes instead of furniture and played tag team marriage when you worked nights? Remember Baseline and then Via Linda and lastly 92nd? Remember when we couldn't comprehend how it could be both dark and scorching hot? You have been my partner through every step of this journey and you've believed in me and reminded me that I could do what I had set out to do even when I felt like I had nothing left. You have supported me in the most abstract and in the most practical of ways. You cooked me dinner, let me repurpose the 2nd bedroom into my own home office (which I often locked you out of), challenged me when I needed it, agreed with me when I needed it, celebrated all my little victories and comforted me in my disappointments. Your hugs and kisses made these words possible. I have leaned on you so many times and you have handled it with such grace and patience because that is who you are. I love you deeply. I know it has not been easy for you either, but we did it! This is ours baby.

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TABLE OF CONTENTS

Page

CHAPTER

1 INTRODUCTION 1

2 BACKGROUND LITERATURE 5

Positive Psychology 5

Positive Education 11

Stress Reducation and Managaement Programs 21

Positive Psychology Interventions (PPIs) 22

Summary and Rationale for Current Study 36

3 METHOD 39

Participants and Recruitment 39

Interventions 41

Measures 44

Procedures 48

Design and Analysis 51

4 RESULTS 52

Overall Analysis Strategy 52

Hypotheses 1 and 4: Effect of Treatment on Perceived Stress 53

Hypotheses 2 and 5: Effect of Treatment on Happiness 56

Hypotheses 3 and 6: Effect of Treatment on Resilience 57

CHAPTER Page

Hypothesis 7: Testing the Moderating Effect of Program Type 60

Follow-up Questions 62

5 DISCUSSION 63

Limitations 70

Implications and Future Directions 71

Conclusion 73

REFERENCES 75

APPENDIX

A IRB APPROVAL: EXPEDITED REVIEW 100

B NEWSLETTER BLURB 102

C RECRUITMENT EMAIL 104

D ONLINE FORM 106

E PARTICIPANT DEMOGRAPHICS 110

F PERMISSION TO USE POSITIVE PSYCHOLOGY INTERVENTION 114

G POSITIVE PSYCHOLOGY INTERVENTION PROTOCOL 118

H INFORMATIVE STRESS GROUP PROTOCOL 120

I PERMISSION TO USE ASU MATERIALS 128

J WAITLIST CONTROL GROUP PROTOCOL 130

K GRADUATE STRESS INVENTORY-REVISED (GSI-R) 132

L STEEN HAPPINESS INDEX (SHI) 134

M RESILIENCE SCALE FOR ADULTS (RSA) 139

N DEMOGRAPHIC QUESTIONNAIRE 144

CHAPTER Page

O FOLLOW-UP QUESTIONS 147

P PRE-ANALYSES 149

Q ANALYSES 154

CHAPTER 1

INTRODUCTION

While concepts related to positive psychology have been studied throughout the 20th century (Snyder & Lopez, 2002) Martin Seligman's 1998 American Psychological Association (APA) Presidential Address urged psychologists to move beyond a focus on pathology and marked the collective nascence of the field of positive psychology (Fowler, Seligman, & Koocher, 1999). In 2000, the *American Psychologist* devoted a special issue to positive psychology highlighting research on happiness, subjective well-being, optimism, creativity, and more (Seligman, & Csikszentmihalyi, 2000). In 2006, an entire journal, *The Journal of Positive Psychology*, was created to showcase the growing body of literature. Today, a PsycInfo search of "positive psychology" yields 138,065 results, with 102,338 of them produced since 2000. Since its inception, positive psychology has been applied in a multitude of contexts, including the military, education, forensic settings, psychotherapy, health care, and the workplace (Linley, Joseph, Maltby, Harrington, & Wood, 2009; Matthews, 2008). A growing body of scholarship indicates that positive psychology interventions (PPIs), or interventions designed to promote happiness and well-being (Miller & Duncan, 2015), yield many significant, beneficial results for individuals and organizations (Sin, & Lyubomirsky, 2009; Snyder & Lopez, 2009). Despite being a fairly new field, positive psychology has grown exponentially and continues to be relevant to various environments because of the potency of its interventions.

Specifically, higher education seems to be a natural fit for the application of positive psychology for a number of reasons. The goals of higher education, such as the

holistic development of individuals in their pursuit of personal and professional endeavors, align with the goals of positive psychology to help individuals develop and thrive (Marks & Wade, 2015).

Pursuing a higher education degree can be a stressful and rigorous process (Chiauzzi, Brevard, Thum, Decembrele, & Lord, 2008; Deckro et al., 2002). Applying concepts from positive psychology, such as the use of internal and external resources to build resilience, can have several positive results. It can help buffer individuals from the harmful effects of stress throughout their schooling while also supporting students in the development of life skills known to produce robust personal and professional lives (Marks & Wade, 2015). Additionally, given the growing concern of the negative impact of mental health issues on college campuses, the application of positive psychology, with its strength-based focus on well-being, can yield individual and collective benefits (Wyatt & Oswalt, 2013). Despite these reasons, scholars contend that researchers have insufficiently addressed the numerous, relevant applications of positive psychology to higher education (Clonan, Chafouleas, McDougal, & Riley-Tillman, 2004).

Furthermore, much of the positive psychology research produced in education applies to K-12 and undergraduate, rather than graduate, populations (Waters, 2011). As of Fall 2014, over 2 million graduate students were enrolled and recent trends suggest an increase in enrollment rates since then (Allum & Okahana, 2015). Graduate students are a sizable population often neglected in discussing how positive psychology can be utilized to help students excel. As with undergraduate students, research indicates that graduate students experience a great deal of stress and that the nature of and responsibilities associated with their programs may leave them even more vulnerable to

stress and mental health issues (Wyatt & Oswalt, 2013). Also, the positive psychology literature that has been devoted to graduate students is unrepresentative of the diversity of this population. Specifically, researchers have paid much attention to the application of positive psychology interventions (PPIs) to graduate students in the helping fields, namely psychology and social work (Botta, Cadet, & Maramaldi, 2015; Burkhart, 2014; Nelson, Dell'Oliver, Koch, & Buckler, 2001). It is important to note that graduate students in the helping fields are particularly vulnerable to mental health issues such as depression, anxiety, and compassion burnout (Myers et al., 2012; Newsome, Christopher, Dahlen, & Christopher, 2006; Riley, 2003; Turner et al., 2005). However, the content addressed in these programs already emphasizes the importance of self-care, social connection, and well-being, even if students may not be applying these concepts to their personal lives. Statistics indicate that most graduate students are not enrolled in the Social and Behavioral Sciences (8%), but instead in Education, Business, Health, and Engineering (over 50% collectively; Allum & Okahana, 2015). Thus, more than half of the graduate student population is overlooked in the higher education positive psychology literature. Students in Business or Engineering, for example, may need even more attention given that the content covered in their programs is unrelated to health and wellness. Graduate student populations will continue to grow. Developing and testing PPIs for a broader group of graduate students is a pressing need with implications for individuals and institutions.

This current study seeks to investigate the impact of a randomized control trial of an online PPI for an interdisciplinary audience of graduate students at a large public university in the Southwest. In the following review, I will elaborate on the history and

theoretical foundation of positive psychology, examine the applicability of PPIs to higher education, identify and explain the specific positive psychology concepts relevant to this PPI, and discuss the relevance of positive psychology to the specific issues faced by graduate students.

CHAPTER 2

BACKGROUND LITERATURE

Positive Psychology

It is important to note that psychologists such as Maslow (1954, 1962), Jahoda (1958) and Vaillant (1977) studied well-being long before the term "positive psychology" was used to describe this field of study (Seligman, Steen, Park, & Peterson, 2005). Yet, Peterson and Park (2003) argue that the use of the term "positive psychology" coalesced research that had been previously dispersed and disconnected in an important way. Positive psychology grew out of the desire to shift away from a pure focus on the negative aspects of functioning (i.e., pathology) and to instead pursue an understanding of the "positive features that make life worth living" (Seligman & Csikszentmihalyi, 2000). Seligman and Csikszentmihalyi define positive psychology as "the scientific study of positive human functioning and flourishing on multiple levels that include the biological, personal, relational, institutional, cultural, and global dimensions of life" (Seligman & Csikszentmihalyi, 2000). Seligman et al. (2005) highlight:

> Positive psychology is an umbrella term for the study of positive emotions, positive character traits, and enabling institutions. Research findings from positive psychology are intended to supplement, not remotely to replace, what is known about human suffering, weakness, and disorder. The intent is to have a more complete and balanced scientific understanding of the human experience—the peaks, the valleys, and everything in between … a complete science and a complete practice of psychology should include an understanding of suffering and happiness, as well as their interaction, and validated interventions that both relieve suffering and increase happiness—two separable endeavors. (p. 410).

Rather than working within a remediation framework to heal what already has been assumed to be damaged, and serving as a complement to traditional psychology, positive

psychology goes beyond prevention to seek to identify the very components that contribute to excellence and flourishing (Seligman, 2011).

Positive psychologists posit that examining pathology does not adequately provide scholars with the ingredients that contribute to a meaningful, productive, and satisfying life (Seligman & Csikszentmihalyi, 2000). Thus, positive psychology explores the various factors contributing to positive emotion, happiness, resilience, and well-being. Scholars contend that these various positive qualities exist, with individual differences, and more importantly, can be actively developed and built upon through intervention (Seligman & Csikszentmihalyi, 2000; Seligman et al., 2005). Scholars engage in this scientific exploration of the positive components of human behavior with the goal of empowering and improving the lives of individuals, families, and communities (Pastorino & Doyle-Portillo, 2013). Within these unifying goals, the field of positive psychology is broad and multileveled. Seligman and Csikszentmihalyi (2000) elaborate on this, explaining that:

> The field of positive psychology at the subjective level is about valued subjective experiences: well-being, contentment, and satisfaction (in the past); hope and optimism (for the future); and flow and happiness (in the present). At the individual level, it is about positive individual traits: the capacity for love and vocation, courage, interpersonal skill, aesthetic sensibility, perseverance, forgiveness, originality, future mindedness, spirituality, high talent, and wisdom. At the group level, it is about the civic virtues and the institutions that move individuals toward better citizenship: responsibility, nurturance, altruism, civility, moderation, tolerance, and work ethic. (p. 5).

Given the embeddedness of the individual within the collective, and the past within the present and the future, studying the interactions between these levels is also salient.

The foundation of positive psychology is built on the notion that the opposite of illness is not wellness (Clonan et al., 2004; Keyes, 2005, 2007). If well-being is more

than just the absence of disease, an exploration of the components of well-being is pivotal to an understanding of positive psychology. While there is no one way to define well-being, scholars agree that it is a multicomponent construct which includes emotional, mental, physical, psychological, spiritual, and social dimensions (Oades, Robinson, Green, & Spence, 2011). A parsimonious and well-accepted conceptualization of well-being is Seligman's PERMA model (2011) which lends theoretical and empirical support to understanding well-being as composed of various factors (Kern, Waters, Adler, & White, 2015). In this model, well-being is comprised of: Positive emotions; Engagement; Relationships; Meaning; and Accomplishments. Seligman theorizes that individuals who experience positive emotions, such as joy and gratitude, engage with activities that absorb them fully ("flow," Csikszentmihalyi, 2008), have supportive relationships, develop a sense of meaning and purpose in their life, and identify and pursue goals truly "flourish" (Seligman, 2011). Given its importance in the lives of all individuals, the United Nations approved a resolution in 2012 "recognizing the relevance of happiness and well-being as universal goals and aspirations in the lives of human beings around the world and the importance of their recognition in public policy objectives" (United Nations, 2012). The pursuit of well-being, a multicomponent construct, is a worldwide issue and goal.

Regarding terminology, it is important to note that in the literature "well-being" and "happiness" are often used interchangeably, with the latter being considered more colloquial (Lyubormirsky & Della Porta, 2010). Common understandings of happiness in the literature include the high frequency of positive affect, low frequency of negative affect, and a high satisfaction with life (Hills & Argyle, 2002; Miller & Duncan, 2015). Seligman and colleagues (2005) contend that there are 3 distinct paths to happiness:

positive emotion, engagement, and meaning. The term, "happiness," is also often connected and used interchangeably with "life satisfaction" (Lyubomirsky, King, & Diener, 2005).

In international studies, scholars have found that regardless of location, people generally want to be happy (Diener, 2000; Diener, Saptya, & Suh, 1998; Diener & Seligman, 2002). Their pursuit of happiness is well-intentioned, albeit unrealized for a majority of individuals (Seligman, 2011). There are many social, physical, and health benefits that result from being happy (Ben-Shahar, 2007; Pressman & Cohen, 2005). A meta-analysis of 225 empirical studies (Lyubomirsky, King, & Diener, 2005) confirmed that positive emotions were predictors of good relationships, physical health, and performance at work. Lyubomirsky et al., (2005) stress that short-term experiences of positive affect, as well as long-term happiness, are connected to: positive perceptions of self and others; sociability and activity; likability and cooperation; prosocial behavior; physical well-being and coping; and problem solving and creativity. Other large-scale meta-analyses have corroborated these findings (Howell, Kern, & Lyubormirsky, 2007; Steptoe, Dockray, & Wardle, 2009), adding that happiness boosts physical health and immunity, buffers the negative impact of stress, and reduces likelihood of accidents and suicide.

Positive psychology researchers argue that happiness is a choice; happiness spreads; and happiness is an advantage (Achor, 2014; Ferguson & Sheldon, 2012). In other words, happiness is a skill that can be intentionally developed. Once experienced, happiness can positively improve surroundings and yield individual and collective benefits. Achor's (2012) study with tax managers found that after participating in short

exercises everyday (e.g., mediating for two minutes, writing a positive message to someone in their social support network), these employees scored significantly higher on measures of well-being, optimism, and life satisfaction, when compared to control groups. These benefits were still significant four months after the intervention. This study was replicated (Achor, 2014) with 900 professionals. Results indicated that individuals in the PPI group showed a 20% decrease in stress. Twelve percent reported higher energy and were twice as likely to rate themselves higher on the happiness measure being used (Achor, 2014). Thus, many researchers have investigated and confirmed the techniques through which happiness and subjective well-being can be improved (Achor, 2012, 2014; Layous, Nelson, & Lyubomirsky, 2013; Seligman et al., 2005).

Related to well-being and happiness is the concept of mental health, which the World Health Organization (WHO; 2014) defines as:

> A state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her own community.

In this definition, mental health encompasses several aspects of daily living: an ability to handle everyday stress, be a productive member of the work world, and participate as a community member. Similarly, Keyes (2007) argues that definitions such as the aforementioned "affirm the existing behavioral and social scientific vision of mental health as not merely the absence of mental illness but the presence of something positive" (p. 98). Like wellness and illness, mental health and mental illness cannot be envisioned as two sides of the same construct (Ryff et al., 2006). Indeed, research supports that they "are not opposite ends of a single continuum; rather, they constitute distinct but

correlated axes that suggest that mental health should be viewed as a complete state" (Keyes, 2005, p. 546). For example, not having a depressive disorder is not equivalent to leading a satisfying and fruitful existence but being depressed could have a salient impact on the quality of that individual's subjective experience and their functioning within the world, within their workplace and their greater community. Interestingly, Keyes (2005) found that individuals with moderate levels of wellness reported the same level of impairment in their everyday functioning (e.g., missing half- or full days of work), and worse levels of psychosocial functioning (e.g., goals, resilience, and intimacy) than those individuals who had a mental illness. He also found that only a small portion of the American population (roughly 17-20%) could be considered as functioning at a high level of wellness and mental health (Keyes, 2007). While the mitigation and treatment of mental illness is not a focus in positive psychology, holistic mental health must be acknowledged as an integral part of well-being.

Resilience is also salient to mental health. While various scholars have conceptualized resilience in a number of different ways (Carle & Chassin, 2004), the APA defines it as "the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress" (APA, 2016). Despite their differences in defining resilience, scholars generally agree that resilience includes the experience of adversity and adapting in a positive manner (Fletcher & Sarkar, 2013). The literature on resilience supports the notion that individuals can develop and build resilience through intentional actions and thoughts, such as positive thinking, self-discovery, meditation, social connection, and self-care (APA, 2016). Additionally, resilience can be influenced by environmental influences, as theorized by ecological systems theory (Brofenbrenner,

1979). A meta-analysis conducted by Lee et al. (2013) suggests that the construct of resilience is comprised of positive mental health variables, given its strong positive correlation with self-efficacy, self-esteem, and positive affect. Thus, positive psychologists invested in positive mental health promotion, which entails focusing on how to cultivate factors related to positive mental health within individuals and communities, have also been invested in promoting individual and collective resilience (Mitchell, Vella-Broderick, & Klein, 2010).

Positive Education

Conceptualized as a complement to conventional academic teaching, positive education refers to teaching students the skills necessary to support well-being and promote mental health (Green, Oades, & Robinson, 2011; Norrish, Williams, O'Connor, & Robinson, 2013; Seligman, 2011). Seligman, Ernst, Gillham, Reivich, and Linkins (2009) define positive education as "education for both traditional skills and for happiness" (p. 293). Other scholars add that positive education brings together best-practices in pedagogy, educational theories, and scientific principles from positive psychology (Norrish et al., 2013). Much research in positive psychology indicates that well-being is a key predictor of academic, personal, and professional success giving examples in the form of higher grade point averages, better physical health, and fewer missed days of work (Howell, 2009; Lyubomirsky et al., 2005; Keyes, 2005; Marks & Wade, 2015; Seligman et al., 2009). However, much of the literature on positive education has focused on K-12 populations (Bernard & Walton, 2011; Bond et al., Seligman et al., 2009; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011;

Huebner, Gilman, Reschly, & Hall, 2009; Miller, Nickerson, & Jimerson, 2009; Norrish et al., 2013; Waters, 2011).

Yet, institutions of higher education are an extremely appropriate context for the application of positive education. Historically, colleges and universities have been interested in whole-person development (Marks & Wade, 2015) and have espoused the ideals of facilitating students' learning outside of the classroom in areas such as interpersonal, social, physical, spiritual, cultural, moral, and emotional growth (Macari, Maples, & D'Andrea, 2005; Nuss, 2003). Practically speaking, colleges and universities are often equipped with the practical facilities that provide services in alignment with the tenets of positive education, including counseling, health services, physical fitness, career services, and student affairs, clubs, and organizations. Additionally, they may have more financial resources than do primary or second institutions of education. Despite these ideals and the practical benefits, such ideals may not become reality due to obstacles such as a focus on accomplishments and results, a culture of competition, a lack of understanding about how well-being promotes academic success, growing mental health concerns, and other factors. Marks and Wade (2015) point to how college rankings miss an opportunity to quantify whether their students are happy, healthy, or satisfied, highlighting that while universities are interested in the development of student well-being, their efforts at incorporating the acquisition of wellness skills into traditional curriculum is insufficient. Oades et al. (2011) elaborate on this point, stating that:

> Given the high striving culture of most universities, it is easy for individuals (both students and staff) to neglect social relationships, emphasize extrinsic motivation (e.g., grades/promotion) over intrinsic interest (i.e. learning/innovation), work excessive hours and engage in other patterns of behavior that diminish well-being over both the short and long term (e.g., drug use, inadequate sleep). As such,

> there would seem to be an opportunity for positive psychology to enhance the experience of campus life by influencing the development of a higher educational culture that understands the psychosocial determinants of well-being (e.g., positive emotions-traits-institutions) and seeks to create conditions that cultivate well-being in students and staff. (p. 432).

Indeed, scholars argue that colleges and universities are well-equipped to provide the right conditions under which their students can truly excel (Marks & Wade, 2015). Oades et al. (2011), for example, developed a comprehensive framework for applying Seligman's PERMA model of wellness (2011) across the various contexts within the university: classroom (e.g., teaching students about flow, ending classes with mindfulness exercises); social (e.g., recognizing individuals who contribute to campus life, strengths-based social activities); local community (e.g., volunteering and service efforts, promoting the university as a virtuous organization); faculty/administration (e.g., tapping into intrinsic motivation, education all employees about positive psychology principles); and residential contexts (e.g., offering evidence-based coaching to improve academic performance, providing cross-cultural education).

The possibilities for utilizing institutions of higher education for the promotion of well-being and good mental health is not just a championed ideal, but a practical reality if given the proper attention and priority. Scholars argue that in the same way that academic skills can be taught and assessed within the school system, so too can skills for well-being be explicitly taught and assessed with empirical measures (Waters, 2011). Such efforts can have a myriad of benefits and indeed, research on positive psychology outcomes in the workplace can provide an encouraging picture of these benefits for the individual, such as self-reported satisfaction, and for the organization as a whole, higher rates of productivity (Clonan et al., 2004). To understand the implications of such

benefits for higher education, it is important to understand the context of higher education and the most pressing concerns for students.

Higher education. In the United States, over 20.4 million students are enrolled in degree-granting postsecondary education at over 4,500 different colleges and universities (National Center for Education Statistics [NCES], 2013). Projections estimate that this number will grow to over 23 million by the year 2024 (NCES, 2013). While obtaining a higher education degree has many positive outcomes for the individual and society as a whole, the process is wrought with emotional, mental, social, developmental, and financial pressures and obstacles (Arnett, 2000; Chiauzzi et al., 2008). Throughout this educational experience, college students experience a significant amount of stress (Baghurst & Kelley, 2014; Chiauzzi et al., 2008; Deckro et al., 2002; Hintz, Frazier, & Meredith, 2015). Stress is defined as "any event or environmental stimulus (stressor) that we respond to because we perceive it as challenging or threatening" (Pasorino & Doyle-Portillo, 2013, p. 434). Research suggests that college students may be more vulnerable to stress than general populations given the myriad of new experiences and academic, social, and personal challenges they face (Robotham & Julian, 2006).

The type and amount of stress experienced is salient to its impact. Scholars differentiate between "eustress," which can help to focus attention, motivate, and improve performance for individuals, and "distress," which can cause anxiety, unpleasant emotions, and decrease performance (Selye, 1956, 1964, 1987). Research on stress underscores that perception is vital to determining whether stress will have a beneficial or deleterious effect on the individual (Harris, 1970; Le Fevre, Kolt, & Matheny, 2006).

While a reasonable amount of stress could help to improve behavioral activation (Chapell et al., 2005) motivation, and performance, elevated and chronic levels of stress can have multiple negative effects on physical health (Deckro et al., 2002). For example, in undergraduate populations, higher reported stress is associated with less exercising, more consumption of junk food, less consumption of fruits and vegetables, issues with sleep, colds, headaches, and substance use (Baghurst & Kelley, 2014; Broman, 2005; Dusselier, Dunn, Wang, Shelley, & Whalen, 2005; Hintz et al., 2015; Hudd et al., 2000; Wichianson, Bughi, Unger, Spruijt-Metz, & Nguyen-Rodriguez, 2009).

Mental health. The negative impact of stress on students' mental health is also problematic. Inherent in the definition of mental health is the ability to cope with everyday stresses (WHO, 2014). Yet, research suggests that many college students cannot handle the stress that they are experiencing (Baghurst & Kelley, 2014). In 2014, the American College Health Association (ACHA) surveyed 79,266 American students finding that in the last 12 months, high percentages of students reported that they felt: overwhelmed (77%); hopeless (39.3%); exhausted (not from physical activity; 73.3%); lonely (51.3%); and sad (52.1%) (2014). Additionally, many reported feeling: overwhelming anxiety (42%); overwhelming anger (32.4%), and depression (27.8%). Furthermore, 7.4% of students reported that they had considered suicide and 4.4% had engaged in self-harming activities over the last 12 months (ACHA, 2014). A majority of students (67.9%) reported more than one significant stressor in their life with academics being the top stressor reported, followed by finances and intimate relationships (ACHA, 2014). In the last 12 months, almost a third of students (22.9%) reported being diagnosed and treated by a professional for mental health disorders, with depression and anxiety

being most prevalent (ACHA, 2014). Stress can both contribute to mental illness and worsen pre-existing disorders with which many students enter college (Guthman & Iocin, 2010). Similar, smaller studies have echoed these national results, adding that stress is a high threat to academics and is experienced by students in high frequency (Jackson et al., 2012; Lust et al., 2015).

A growing body of research confirms that student distress levels have increased significantly in recent years and that often, students experience these heightened levels of distress throughout their college experience (Schwartz, 2006). Prescription medication is utilized at an alarmingly rate of more than five times what it was in the 1990s (Schwartz, 2006). Current data projects continued increases given that the level of severity in mental illness presenting in the college level population is also increasing (Guthman & Iocin, 2010). Increases in the severity and prevalence of college student mental health issues place heavy burdens on college counseling centers to meet students' needs (Douce & Keeling, 2014; Kitzrow, 2003; Watkins, Hunt, & Eisenberg, 2012). However, many do not seek professional help due to various internal (perceptions of help-seeking behavior, lack of motivation or time) and external (stigmatization of mental illness) barriers (Eisenberg, Golberstein, & Gollust, 2007; Eisenberg, Gollust, Golberstein, & Hefner, 2007). This is particularly true for students of color (Han, & Pong, 2015; Masuda, Anderson, & Edmonds, 2012) and international students (Golberstein, Eisenberg, & Gollust, 2008; Masuda & Boone, 2011), who may already be facing more stress due to discrimination and assimilation processes.

In response to President Obama's call to increase dialogue surrounding issues of mental health, a report published by NASPA - Student Affairs Administrators in Higher

Education, the APA, and the American Council on Education (ACE) (Douce & Keeling, 2014) states that, "recognizing and treating anxiety and depression, effectively managing stress and behavioral health problems, and improving the quality of the learning environment can all be expected to strengthen learning outcomes for students of any age and in any context" (p. 3). Indeed, stress and its impact on mental health are nationally salient issues in higher education as they significantly impact many individual, institutional, and societal outcomes. Students experiencing high levels of stress miss more class, have lower grade point averages, and are more likely to drop out of courses and not graduate (Chiauzzi et al., 2008). Given that many students do not seek professional help and may lack coping strategies to adequately deal with stress, they may turn to using/abusing substances and engaging in risky behaviors instead (Broman, 2005; Dusselier et al., 2005), further endangering their physical and mental health. Stress has been shown to decrease students' ability to concentrate and lower academic performance. Poor grades often factor into students' decisions to leave college altogether (Pritchard & Wilson, 2003). High levels of stress can negatively impact students' academic performance and personal health in a number of ways (Baghurst & Kelley, 2014; Chang, 2006; Chiauzzi et al., 2008; Deckro et al., 2002; Gan, Shang, & Zhang, 2007; Hintz et al., 2014; Hall, Chipperfield, Perry, Ruthig, & Goetz, 2006; Hudd et al., 2000; Jacobs & Dodd, 2003; Misra & McKean, 2000; Rayle & Chung, 2007; Wyatt & Oswalt, 2013). While undergraduate student attention to these issues is important, far less attention has been devoted to investigating the impact of stress on and the mental health of graduate students who make up a sizable portion of degree-seeking students.

Graduate student concerns. Over two million graduate students were enrolled in programs across the United States as of Fall 2014 (Allum & Okahana, 2015) with current projections estimating that 3.5 million graduate students will be enrolled by 2024 (NCES, 2013). Data gathered by the ACHA of 79,266 students, which included results from 9829 graduate students (12.4% of total respondents; 2014), indicated that many mental health issues faced by undergraduates are shared by graduate students. Scholars in psychology and social work have explored the mental health of their graduate students and designed interventions to help students incorporate self-care (Botta, Cadet, & Maramaldi, 2015; Burkhart, 2014; Nelson, Dell'Oliver, Koch, & Buckler, 2001). However, with a majority of graduate students studying in fields like Business and Engineering (Allum & Okahana, 2015), many graduate students are likely not receiving information about how to take care of themselves throughout their demanding programs. A few studies focused on the specific stressors and psychological distress of students in medicine and engineering (Adams, 2004; Dyrbye, Thomas, & Shanafelt, 2006; Keenan & Newton, 1985), for example, highlight that students in these fields are also in dire need of skills related to the promotion of wellness. Data indicate that international graduate students experience additional, acculturative stress (Mallinckrodt & Leong, 1992; Meghani & Harvey, 2016; Myers-Walls, Frias, Kwon, Ko, & Lu, 2011). Other research points to the increased stress during the first year of graduate school (Goplerud, 1980), and the specific obstacles faced by women and students of color (Herzig, 2004; Maton et al., 2011; Ramirez, 2014; Syed & Chemers, 2011). Regardless of discipline, year in school, or demographics, graduate students face a plethora of responsibilities including coursework, research, assistantships, other forms of employment, family responsibilities,

and training, which directly and negatively impact their ability to engage in activities that promote health like sleep, exercise, healthy eating, and interpersonal connection (Mazzola, Walker, Shockley, & Spector, 2011; Myers et al., 2012; Rocha-Singh, 1994).

With more institutions of higher education offering four-plus-one year and other, non-traditional formats of obtaining a graduate degree, as well as the wide rage range of college undergraduates, previously clear demographic distinctions between undergraduate and graduate students may be diminishing (ACHA, 2014). To distill some of the key differences and similarities between undergraduate and graduate mental health issues and outcomes, Wyatt and Oswalt (2013) used the ACHA (2014) survey to compare 27,387 undergraduate and graduate students from 55 universities across the nation. Similarities between the groups included: numbers of diagnosed mental health issues, with depression being almost identical; reports of "personal issues" that students experienced as traumatic or difficult within the last 12 months; and the negative impact on and disruption of academic progress caused by personal problems. Differences between the two groups were also uncovered, including: graduate students were 6.4 years, on average, older; more graduate students worked and volunteered more hours a week; graduate students reported significantly more stress associated with career-related issues (32.9% versus 21.9%) while undergraduates identified more issues as traumatic or difficult to handle (e.g., academics, health of a family member, intimidate relationships); more graduate students stated they had "tremendous" (10.3% versus 9.4%) and "more than average stress" (44.2% versus 39.3%), while more undergraduates reported "average stress" (39.7% versus 33.1%); and graduate students were significantly more likely to seek mental health (74%) than undergraduates (64.8%).

These similarities and differences bring to light important considerations in the health and wellness of graduate students. While graduate students' age might serve as a protective factor in helping buffer some of the issues undergraduates find difficult to deal with (e.g., personal appearance, family problems), it is clear that graduate students spend more hours working and volunteering. Kausar (2010) confirms an association between greater number of hours spent in class, research labs, and completing academic work and elevated levels of perceived stress. Such levels of stress could make graduate students particularly vulnerable to burnout, which has been linked to poor academic outcomes and negative attitudes about the learning environment and available support services (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). Qualitatively different from undergraduate experience, the graduate experience is characterized by deeper focus on a singular content area, greater attention to professional development, and more pressure associated with finances, career planning, and the responsibilities of graduate student assistantships (Fox, 2008; Mazzola et al., 2011; Oswalt & Riddock, 2007). However, these differences do not mitigate the physical, emotional, and social impact of such stress on graduate students (Hyun, Quinn, Madon, & Lustig, 2006). Graduate students can often live unbalanced lives with their career pursuits leading them to neglect factors that are known to improve and maintain well-being, such as exercise, leisurely activities like hobbies, and relationships (Oswalt & Riddock, 2007; Wyatt & Oswalt, 2013). Additionally, many university-wide social and cultural activities are targeted toward undergraduate students, leaving graduate students disconnected from the greater university community (Fox, 2008). Such disengagement is associated with decreased academic performance and satisfaction with life (Schaufeli et al., 2002). While they

share some important similarities with undergraduate students, graduate students are a unique population at an increased risk for certain health and wellness issues. Despite having similar prevalence rates of mental illness and being at increased risk for various academic and wellness issues, graduate students are often ignored in scholarship surrounding health and wellness initiatives (Chiauzzi et al., 2008; Baghurst & Kelley, 2014; Deckro et al., 2002; Eisenberg, Golberstein, et al., 2007; Eisenberg et al., 2007; Owens, 1999; Prestin, 2012).

Stress Reduction and Management Programs

Given the prevalence of stress experienced by undergraduate and graduate students and its deleterious effects on various aspects of health and academic performance, a large number of studies have focused on stress management and stress reduction programs with generally positive results (Chiauzzi et al., 2008; Deckro, 2002, Frazier et al., 2015; Hintz et al., 2014; Hudesman, Beck, & Smith, 1987; Johansson, 1991; Mallinckrodt, Leong, & Fretz, 1985; Ratanasiripong, Sverduk, Hayashino, & Prince, 2010; Regehr, Glancy, & Pitts, 2013; Rubin & Feeney, 1986). However, these programs are often founded on outdated theories that equate the absence of stress with well-being. While reducing students' experiences of stress and giving them coping strategies to handle the stress that is inevitable during the college years is a worthwhile endeavor, it does not ensure that students will be living optimally (Clonan et al., 2004, Keyes, 2005, 2007). Also, reducing stress neither fundamentally changes an individual's relationship to or perception of stress nor creates a positive culture in which to buffer students from the negative impact of stress in the future, both of which may be more important than reducing current stress levels (Achor, 2012, 2014; Folkman, Lazarus,

Dunkel-Schetter, DeLongis, & Gruen, 1986). Furthermore, research suggests that students, even if interested, rarely participate in activities, take classes, or attend workshops that are explicitly focused on stress management (Coyne & Racioppo, 2000). The state of graduate student stress calls for a different approach.

Positive Psychology Interventions (PPIs)

Sin and Lyubomirsky define PPIs as targeted actions "aimed at cultivating positive feelings, positive behaviors, or positive cognitions" (2009 p. 467). Waters (2011) adds that these could be programs, practices, treatment methods, or activities (2011, p. 76). Rather than being focused on the reduction of negative behaviors (e.g., smoking, excessive drinking) or experiences (e.g., stress, negative emotion) as a mechanism for improving well-being, PPIs focus on the active development of positive behaviors and experiences (Waters, 2011).

Rather than replacing wellness initiatives that seek to reduce negative aspects of functioning, PPIs provide a complementary approach in the pursuit of helping students achieve a complete state of mental health. Scholarship from over the last decade of positive psychology documents that individuals who are mentally healthy experience a wide range of advantageous correlates and outcomes, including resilience, energy, social engagement and creativity (Lyubomirsky et al., 2005). Psychologically healthy individuals are strengthened in the face of challenge and adversity, are better equipped to handle ambiguous and difficult circumstances, and take more productive intellectual risks (Douce & Keeling, 2014). Waters' (2011) meta-analysis of 12 PPIs within K-12 schools and other individual studies suggest that these interventions can significantly improve students' well-being (Suldo, Savage, & Mercer, 2014). Meyers, van Woerkom, and

Bakker's (2013) review of 15 PPIs carried out in the workplace were efficacious for increasing well-being, positively impacting performance, and lessening stress and burnout, and, minimally, depression and anxiety. Additional workplace PPI studies not covered in their analysis echo the same positive results (Kaplan et al., 2014). Cohn and Fredrickson (2010) verify that PPIs can have lasting, positive effects and several studies point to the cost-effective and impactful nature of online PPIs (Bolier et al., 2014; Cavanagh et al., 2013; Mitchell et al., 2010; Selgiman et al., 2005). Given the urgency of addressing mental and behavioral health issues on college campuses for all students, PPIs offer a cost-effective and empirically-validated intervention. A report published by several national agencies (Douce & Keeling, 2014) describes the importance of resilience and psychological well-being to students' holistic functioning. The report encourages universities to move beyond a remediation and reduction framework to adopt a more positive, inclusive approach to well-being, stating:

> But effective clinical services for students with recognized mental and behavioral health problems will not alone promote learning and create a healthy campus environment. Mental and behavioral health is a critical component of well-being for all students, and having a campus culture and learning environment that supports healthy minds is a core need deeply centered in the mission of every institution of higher education. The best way for colleges and universities to nurture resilience among students is to promote health and well-being, especially mental and behavioral health, at both individual and community levels. (p. 3).

To effectively respond to this prompt to promote mental health and well-being, higher universities can utilize the implementation of PPIs, which have been implemented in businesses, K-12 schools, and the community with moderate to strong empirical results (Lyubomirsky et al., 2005).

It is useful to explore the theoretical foundation undergirding the efficacy of PPIs

for improving well-being. The broaden-and-build theory of positive emotion (Frederickson, 1998, 2001, 2003, 2004, 2009) posits that the experience of positive emotion facilitates the development of skills, called resources, needed for survival. These resources include the following domains: intellectual (learning, problem-solving), physical (coordination, strength), social (creating and maintaining connections), and psychological (resilience, optimism; Frederickson, 2003). Supported by cross-sectional and longitudinal research, this theory is useful in conceptualizing how the conjuring of positive emotions can be utilized as an intervention to improve cognition, mood, academic performance, and resilience (Catalino et al., 2014; Marks & Wade, 2015; Toepfer, Altmann, Risch, & Wilz, 2015). Positive emotions allow individuals to be more creative, resilient, and open to novel ways of thinking and behaving (Frederickson, 2003).

While the broaden-and-build theory offers a theoretical understanding of how PPIs function, it is also useful to review literature centered around the salient components of PPIs: positive emotions, especially gratitude (Frederickson, 2009; Seligman et al., 2005); social support (Diener & Seligman, 2002; Holt-Lunstad, Smith, & Layton, 2010); mindfulness (Hölzel et al., 2011; Kabat-Zinn, 2003); and exercise (Fox, 1999; Hogan, Catalino, Mata, & Fredrickson, 2015). For example, PPIs that elicit a sense of gratitude, strengthen perceptions of social support, develop mindfulness skills, and promote exercise all facilitate well-being through the experience of positive emotion (Achor, 2012, 2014; Ben-Shahar, 2007; Diener & Seligman, 2002; Garland et al., 2015; Hogan et al., 2015; Seligman et al., 2005). Each of these components also has unique benefits. Along with promoting wellness, these components can simultaneously help relieve stress, encouraging optimal functioning. Below, I will discuss these components individually

and also highlight the benefits of multicomponent PPIs.

Positive Emotions. Positive emotions, such as joy, hope, and gratitude, have been prominently featured in positive psychology research. Scholars contend that these emotions are hard to define because of their multidimensionality (Emmons & McCullough, 2003, Seligman et al., 2005) and research emphasizes the interconnectedness of the various positive emotions (Emmons & McCullough, 2003; Frederickson, 2009). Gratitude is one of the most well-studied positive emotions. Peterson and Seligman define gratitude as "a sense of thankfulness and joy in response to receiving a gift, whether the gift be a tangible benefit from a specific other or a moment of peaceful bliss evoked by natural beauty" (2004, p. 554). Gratitude can both be a result of and result in experiences of happiness (Seligman et al., 2005).

Various studies have found the benefits of gratitude to be positively associated with happiness, optimism, life satisfaction, hope, and positive emotion, and negatively associated with depression, anxiety, and negative affect (McCullough, Emmons, & Tsang, 2002; Watkins, Woodward, Stone, & Kolts, 2003). Wood, Joseph, and Linley (2007) found gratitude to be positively correlated with seeking both emotional and instrumental social support, positive reinterpretation and growth, active coping, and planning; and negatively correlated with behavioral disengagement, self–blame, substance use, and denial. Gratitude seems to play an important role in building and maintaining social relationships through the expression of thanks and a willingness to reciprocate kind acts (Clark & Mills, 2011; Emmons, 2004, 2013; Miller & Duncan, 2015). Gratitude also plays an integral role in the development of community given its

connection to motivating individuals to engage in prosocial behaviors and contribute to society (Frederickson, 2004; Froh, Bono, & Emmons, 2010; Roberts, 2004).

Several studies have incorporated the use of gratitude exercises into their exploration of mechanisms for increased happiness and well-being (Emmons & McCullough, 2003; Seligman et al., 2005). While studies emphasize the benefits of gratitude, such as its role in growth from trauma, they also note that gratitude interventions might be most beneficial for those who have low levels of gratitude ((Nelson, 2009; Rash, Matsuba, & Prkachin, 2011). In several studies, Seligman and his colleagues asked their participants to write down "three good things" daily along with explanations for each positive thing and to write and hand-deliver a letter of gratitude to someone in their life, a "gratitude visit" (Seligman et al., 2005). The activities resulted in an increase in immediate happiness and an increase in their happiness up to six months after the intervention. Similarly, in a study by Emmons and McCullough (2003), participants who wrote down three blessings on a daily or weekly basis, reported improvements in their mood and coping behaviors, although they did not engage in more health-promoting behaviors. Replications of these studies have been conducted with students (Maybury, 2013) and the general population (Mongrain & Anselmo-Matthews, 2012) with similar results. It is important to note that after conducting a meta-analysis of gratitude interventions, Davis et al. (2016) caution against overstating any long-term impact of such interventions. Future longitudinal research can help identify whether these benefits are long-lasting.

The functionality of positive emotions, like gratitude, can be explained with Barbara Frederickson's comprehensive "broaden and build" theory (1998; 2001, 2004,

2009), which postulates that positive emotions serve an adaptive function, crucial to survival. The experience of positive emotion leads individuals to "broaden their thinking," so they are clearer, more creative, more attentive, and open to new possibilities and experiences. Positive emotions also help individuals to "build" through learning and the developing skills and resiliency. Comparatively, negative emotions, such as fear or sadness, can cause cognitive restriction and weakened coping (Catalino, Algoe, & Fredrickson, 2014). Within educational settings, this theory has been used to conceptualize how positive emotions can facilitate well-being, academic productivity and performance, and learning through broadened cognition and the development of actions to intentionally choose positive emotions (Catalino et al., 2014; Marks & Wade, 2015; Toepfer, Altmann, Risch, & Wilz, 2015). Empirical studies conducted with undergraduate students highlight that writing about positive experiences, for example, can increase positive mood, and is associated with higher ratings of life satisfaction and lower negative health outcomes, such as visits to the health center (Burton & King, 2004; Cohn, Fredrickson, Brown, Mikels, & Conway, 2009). Several studies provide empirical support for long-term benefits (Catalino et al., 2014; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Kok et al., 2013).

Social Support. Social support is a broad term used to describe the support that is available and offered by family, friends, and others (Verheijden, Bakx, van Weel, Koelen, & van Staveren, 2005). Scholars differentiate between functional social support, which refers to the presence and number of supportive relationships, and structural social support, which refers to the perceived value of one's social relationships (Hefner & Eisenberg, 2009). Regardless of type, social support and relationships have been shown

to be powerful predictors of psychological, academic, and physical health outcomes. A study at Harvard University with 1,648 students found a .71 correlation between happiness and social support (Achor, 2012). A similar study with 222 undergraduate students mirrored these results, finding relationships to be a significant indicator of happiness (Diener & Seligman, 2002). In a sample of 1378 undergraduate students, Hefner and Eisenberg (2009) found that those with lower quality relationship were more likely to experience mental health problems, including a six-fold increase of depressive symptoms relative to students with high quality social support. Social support impacts mortality, with high levels of support predicting longevity as reliably as regular exercise (Holt-Lunstad et al., 2010). High levels of support increase the likelihood of survival by 50%, and low levels are as harmful as high blood pressure (Holt-Lunstad et al., 2010). Social support buffers against test anxiety and academic stress, increases resilience, and is associated with levels of cortisol in the body (Conneely & Hughes, 2010; Misra, McKean, West, & Russo, 2000; Wilks & Spivey, 2010). The buffering hypothesis of social support has been confirmed by multiple studies in the community (Cobb, 1976; Cohen, 2004) and within the graduate student population to the benefit of their personal and academic pursuits (Calicchia, & Graham, 2006; Mallinckrodt & Leong, 1992; Townsend, 2011).

Given the many, positive correlates of social support, it is crucial for students to have strong support networks. Research confirms that students of color, international students, and students from low socioeconomic backgrounds are at a greater risk of being social isolated (Hefner & Eisenberg, 2009). These populations already face difficulties in their graduate student experience and thus, interventions aimed at increasing social

support for these populations are needed. Data suggests that the presence of social support for international students can have even greater benefits, especially for measures of well-being, than for native students (Hefner & Eisenberg, 2009; Yang, Haydon, & Miller, 2013; Mallinckrodt & Leong, 1992). It is not just the availability of supportive people that determines social support, but the perception of support. Thus, PPI interventions aimed at increasing perceptions of being supported might be just as useful as increasing actual support.

Mindfulness. Mindfulness refers to the intentional and conscious awareness of the present moment, without judging or evaluating the experience (Kabat-Zinn, 2003). Mindfulness meditation both activates (at the prefrontal cortex and cingulate gyrus) and relaxes (at the posterior of the parietal lobe, thalamus, and brainstem) the nervous system, resulting in the simultaneous relaxation of the body and sharpening of the mind's attention and perception processes (Simpkins & Simpkins, 2014). Hölzel et al. (2011) found that routinely practicing mindfulness meditation led to increases in regional gray matter density in the brain. Mindfulness is a well-studied concept, with a large body of scholarship confirming its many positive benefits in a number of different areas. Physical benefits of mindfulness include: a reduction in risk factors for metabolic and cardiovascular diseases (Prasad, et al., 2006); enhanced mood (Shapiro et al., 2007); less fatigue, depression, headaches, and back pain, as well as a reduction in stress (Michalsen et al., 2005). Cognitive benefits include: improvement in memory (Simpkins & Simpkins, 2014); mental balance and improved cognitive processing (Sarang & Telles, 2006); and greater ability to focus attention and improve tolerance to stress (Vaitl et al., 2005). Psychological and social benefits include: reduced anxiety and experience of

loneliness (Simpkins & Simpkins, 2014); activations in the brain related to empathy and connectedness to others (Weng et al., 2013); decrease in overreactions to negative emotions, rumination, and self-focus, associated with depression, and increased engagement with sensing (Farb et al., 2010); and improved outcomes in the treatment of various psychological issues such as anxiety, depression, bipolar disorder, disordered eating, substance use, and trauma (Bowen et al., 2006; Butryn et al.m 2013; Davis & Kurzban, 2012; Emerson & Hopper, 2011; Roemer & Orsillo, 2009; Weintraub, 2004, 12; Williams et al., 2008). Several scholars posit that mindfulness is a powerful mechanism by which well-being can be attained, highlighting mindfulness as an example of the broaden-and-build theory in practice (Coffey, Hartmen, & Fredercikson, 2010; Fredrickson et al., 2008; Garland, Farb, Goldin, & Frederickson, 2015; Kok, Waugh, & Frederickson, 2013).

Given the appropriateness of these benefits to students, several studies have investigated mindfulness interventions in higher education (Barbosa et al., 2013; Botta, 2015; Cavanagh et al., 2013; Cohen & Miller, 2003; Newsome et al., 2006). For example, college students assigned to a self-guided mindfulness-based online intervention for two weeks reported significantly less stress and symptoms of depression and anxiety than the wait-list group (Cavanagh et al., 2013). However, the study suffered from low completion rates and only included an undergraduate student population. Other studies have focused on graduate students. In a group-based mindfulness study with graduate students in social work, Botta (2015) found that mindfulness was associated with: greater executive functioning; emotional regulation; increased immunity; less stress, anxiety, and depression; decreased pain, improved self-awareness, introspection,

and an ability to experience compassion; as well as better grades. Barbosa et al.'s (2013) study supported the efficacy of the empirically sound mindfulness based stress reduction (MBSR; Kabat-Zinn, 2003) protocol for graduate students in healthcare for reducing anxiety and increasing empathy. Cohen and Miller (2009) added a relational component to MBSR training and administered the intervention to a group of psychology graduate students, resulting in decreased perceived stress and anxiety, and increased emotional intelligence. However, these studies focus solely on graduate students in the helping fields. Little is known about the usefulness of these mindfulness-based PPIs to a broader audience of graduate students from other disciplines.

Exercise. The data is clear that exercise has a positive impact on health, from reducing obesity, heart disease, diabetes, and other major physical illnesses (WHO, 1995). Although multiple mechanisms have been identified as contributors, exercise clearly has health benefits for the body and the brain (Ludlow et al., 2008; Thompson et al., 2013). Research on exercise in the last 30 years has been expanded to analyze its benefits on mental health and cognition. There have been thousands of studies and many narrative and meta-analytic reviews focusing on the role of exercise in the treatment of mental illness and the promotion of mental health (Fox, 1999; Hogan et al., 2015). Exercise improves cognitive functioning and performance in individuals of all ages (Hogan, Mata, & Carstensen, 2013) and in young adults particularly, may improve overall executive functioning, such as memory, organization, attention, and decision-making (Hillman, Snook, & Jerome, 2003). Exercise improves mood and the experience of positive emotion (Berger & Motl, 2000; see Reed & Ones, 2006 for meta-analysis) and reduces the experience of negative affect and depressive symptoms (see Mead et al., 2009

for meta-analysis). Physical activity can improve overall mental health through the enhancement of positive affect, the mitigation of negative affect improved sleep, and the buffering of stress (Fox, 1999). Given the well-known link between mental health and exercise, the treatment for most psychological problems include a recommendation for physical activity (Walsh, 2011) and many primary and secondary schools have implemented exercise programs to positively impact the psychosocial functioning and cognitive performance of their students (Ardoy et al., 2014; Fuligni & Hardway, 2007). At the university level, much of the exercise research has focused on ways to understand and subsequently motivate students to engage in physical activity (Armstrong, Henderson, Williams, & Burcin, 2014; Biondolillo & Pillemer, 2015; Matteucci, Albohn, Stoppa, & Mercier, 2012; Sidman, Fiala, & D'Abundo, 2011; Sullum, Clark, & King, 2000; Vartanian & Shaprow, 2008) with some scholars arguing that the benefits of exercise in improving holistic wellness are being overlooked and underestimated (Gieck & Olsen, 2007; Mueser & Cook, 2015).

In comparison to research in undergraduate student populations, less is known about graduate students. VanKim and Nelson (2013) found that among a sample of almost 15,000 undergraduate students, those who engaged in regular vigorous physical activity reported lower levels of stress and mental/emotional distress than those who did not engage in this activity. While lack of exercise and poor sleeping habits have been linked to stress among various adult populations (Walsh, 2011), it is unclear whether this relationship exists in the graduate student population. In a large national sample of 387 graduate students in psychology, El-Ghoroury, Galper, Sawaqdeh, and Bufka (2012) found that over half of the participants reported academic responsibilities, finances,

anxiety, and poor work/school-life balance as stressors and that over 70% identified lack of time as the main factor interfering with their engagement in wellness activities such as seeking social support or engaging in physical activity. However, they also found that just over half (54.3%), identified regular exercise as an important coping mechanism for graduate school stress (El-Ghoroury et al., 2012). Graduate students report multiple stressors and seem to understand the benefit of physical exercise but still struggle with implementing this wellness strategy into their regular routine. The study conducted by El-Ghoroury et al. (2012), also discovered that students' gender, ethnicity, and degree (Ph.D. vs. Psy.D.) impacted their identified stressors, reported exercise-interfering factors, and preferred coping strategies. Thus, more research on PPIs that incorporate exercise as a component could provide valuable insight into how exercise can be used to promote graduate student wellness.

Multicomponent PPIs. While each of the components discussed have been used separately in PPIs, some researchers have combined two or more of these variables to create multicomponent PPIs. For example, studying large samples of professionals in the business industry, Achor (2012, 2014) implemented a simple, three-week PPI where he asked his participants to engage in one of the following five activities everyday: writing down three things for which they are grateful; writing a positive message to someone in their social support network; taking two minutes to write about the most meaningful experience of the past day; meditating for two minutes; and exercising for ten minutes. Each aspect of this protocol has individually been tested in other studies (Cavanagh et al., 2013; Miller & Duncan, 2015; Seligman et al., 2005). Emmons and McCullough (2003) found that the group of undergraduates assigned to keep track of things for which they

were grateful, rather than neutral events or hassles, reported higher levels of positive emotion and other factors related to well-being. Several studies found that engaging in a conscious act of kindness, such as writing a letter of gratitude to someone in your support network, can increase participants' positive emotion (Boehm, Lyubomirsky, & Sheldon, 2011; Lyubormirsky, Sheldon, & Schkade, 2005). Slatcher and Pennebaker (2006) connected expressive writing with positive emotion in a sample of undergraduate couples, suggesting that journaling be used as a tool for the promotion of well-being and relationship building. Frederickson et al. (2008) found that participants who engaged in loving-kindness meditation built a sense of meaning, increased mindfulness, and purpose in life. Babyak et al. (2000) found multiple cognitive benefits of exercise for participants with depression, even six months after the intervention and with only 60% of participants continuing to exercise. Those who continued exercising after the 4-month treatment period had a reduced likelihood of being diagnosed with depression at the end of the 6-month follow-up, suggesting that regular exercise over time has therapeutic benefits.

Achor's combination of these components is beneficial for several reasons. Studies, like Miller and Duncan's (2015) randomized control trial finding no significant differences between gratitude and happiness intervention groups, support the notion that many of these PPI components are similarly efficacious. Giving participants choices can increase adherence to the protocol. Such PPIs more accurately mirror life than single component interventions, given that several different components, rather than one, contribute to well-being. Schueller (2010) found that different individuals prefer specific PPIs and that activity preference is correlated with study results. Multicomponent interventions could result in greater impact given that participants can participate in

activities that are most meaningful and wellness-promoting for them. Participants in Achor's (2014) multicomponent study reported a decrease in stress, an increase in energy, and higher levels of happiness. Other multicomponent PPIs, using protocols similar to Achor's (2012, 2014) with faculty and staff members at various universities, have also yielded positive results (Kaplan et al., 2014; Sherman, 2016).

No study to date has implemented a multicomponent PPI for the larger graduate student population. The development of such a PPI requires considering multiple details. Graduate students have multiple demands on their time, and thus, interventions should be time-efficient. Bolier et al.'s examination (2014) of multiple PPIs suggests that brief (i.e., one-three week) PPIs are more effective than longer (i.e., 6-10 weeks) ones. Many scholars contend that online interventions incorporating multimedia components (e.g., videos) are time and cost-effective, engaging for users of different learning styles, and an incredible mental health opportunity given the limited nature of in-person college campus and community resources (Abbott, Klein, & Ciechomski, 2008; Barak, Klein, & Proudfoot, 2009; Chiauzzi et al., 2008; Drozd, Mork, Niselsen, Raeder, & Bjørkli, 2014; Mitchell et al., 2010; Parks, 2014; Prestin, 2012; Seligman et al., 2005). No significant differences have been found between in-person and online interventions (Layous et al., 2013), so efficacy does not have to be sacrificed for convenience. Additionally, research suggests that demographic variables, such as gender, race, program of study, age, and graduate level of study (masters versus doctoral students) can influence graduate students' perceived stress (El-Ghoroury et al., 2012; Mallinckrodt, Leong, & Kralj, 1989; Rocha-Singh, 1994). Thus, addressing what specific populations would benefit most from multi-component PPIs is salient to developing university initiatives.

Summary and Rationale for Current Study

Two decades ago, scholars called for psychology to move beyond a singular focus on disease and pathology to investigate a holistic view of the human experience (Fowler, Seligman, & Koocher, 1999; Snyder & Lopez, 2002). Recent national surveys highlight that high levels of stress and poor mental health are two of the main obstacles in the way of students' success and thriving in their academic, personal, and professional pursuits (ACHA, 2014; Douce & Keeling, 2014). Today more than ever before, scholars are calling for institutions of higher education to move beyond a remediation approach to contribute to the development of their students' overall well-being (Marks & Wade, 2015; Oades et al., 2011). Positive psychology applied to education, called positive education, can offer the resources and tools needed to help universities maximize their students' potential in a holistic way (Marks & Wades, 2015). The development and promotion of well-being can be a means for improving academics, through retention, graduation, and productivity, while also offering students the skills they need to lead healthy and fulfilling lives in which they are functioning optimally in all aspects of their lives (Armstrong et al., 2014). While stress-management programs can be effective at reducing stress, positive education holds that the management of stress is just a small part of what it means to flourish and thrive (Keyes, 2005, 2007).

There is ample research on PPIs with primary, secondary, and undergraduate students, as well as members of the community (Cavanagh et al., 2013; Cohn & Fredrickson, 2010; Kaplan et al., 2014; Meyers et al., 2013; Seligman et al., 2005; Suldo et al., 2014; van Woerkom & Bakker, 2013; Waters, 2011). Some research suggests that graduate students may experience even more stress than undergraduate students, and yet,

far fewer interventions have been tested among this population. The PPIs that have been developed and tested with graduate student populations focus heavily on psychologically-based programs, such as programs in psychology and social work (Botta, Cadet, & Maramaldi, 2015; Burkhart, 2014; Nelson, Dell'Oliver, Koch, & Buckler, 2001). Students in these programs may already be receiving assistance in understanding stress, the importance of self-care, and the promotion of well-being given that these topics are relevant to psychology. While students in other disciplines might have similar stressors and levels of stress, they seem to be at a higher risk for not receiving information or guidance regarding well-being given the nature of their curricula.

The current PPI consisted of converting Achor's (2012, 2014) three-week protocol into an online intervention for graduate students from a number of different disciplines at a large public university in the Southwest. Given that many university wellness initiatives center around providing students with information regarding the sources of stress, its effects, and positive coping mechanisms, it is important to understand whether the dissemination of this information can also be helpful in the reduction of stress and promotion of well-being (Baghurst & Kelley, 2014; Chiauzzi et al., 2008; Deckro et al., 2002; Hintz & Meredith, 2014). Thus, in this current study, the online PPI was experimentally compared with an online informative stress comparison group and an online wait list control group in impact on students' perceived stress, happiness, and resilience. Special consideration was paid to salient demographic variables to determine which students benefited the most and to control for other variables that could impact outcome measures. Pre-, post-, and three-month follow-up tests were administered to determine whether initial changes were sustained over time.

The following seven hypotheses were tested:

1. Graduate students in the PPI group will report lower levels of perceived stress than graduate students in the informative stress and control groups at post-test and follow-up.
2. Graduate students in the PPI group will report higher levels of happiness than graduate students in the informative stress and control groups at post-test and follow-up.
3. Graduate students in the PPI group will report higher levels of resilience than graduate students in the informative stress and control groups at post-test and follow-up.
4. Graduate students in the informative stress group will report lower levels of perceived stress than graduate students in the control group at post-test and follow-up.
5. Graduate students in the informative stress group will report higher levels of happiness than graduate students in the control group at post-test and follow-up.
6. Graduate students in the informative stress group will report higher levels of resilience than graduate students in the control group at post-test and follow-up.
7. Graduate students from non-psychologically-based programs (e.g., business, law) in the PPI and informative stress intervention groups will benefit most (i.e., have lower scores of perceived stress, and higher levels of happiness and resilience) than graduate students from psychologically-based programs (e.g., psychology, social work) at post-test and follow-up.

CHAPTER 3

METHOD

Participants and Recruitment

Institutional Review Board (IRB) approval was received before recruitment began (ASU IRB STUDY00004364; see Appendix A). Graduate students, including masters and doctoral students from a variety of psychologically-based and non-psychologically-based programs, were recruited from a large public university in the Southwest (Arizona State University; ASU) in the spring of 2016. Psychologically-based programs are defined as programs that include psychology-based courses in their curricula, such as psychology and social work. Given that this study was financially supported by the Graduate and Professional Student Association (GPSA), a call for participation was disseminated via email to those who subscribe for monthly newsletters and other GPSA announcements (see Appendix B for newsletter blurb). Previous GPSA research has shown that students do not read long emails. Thus, advertisements were brief and called for interested students while offering incentives. While approximately 5,000 students received this email, only about 10% opened the email (489 students). Additionally, an email was sent to students in the author's professional network (namely students in her program of study and student leadership colleagues; see Appendix C for recruitment email). Approximately 100 students received this particular email.

All interested students were directed to an online form through a hyperlink in the recruitment materials (see Appendix D for online form). This form specified that this was a 21-day, GPSA-sponsored study seeking to explore graduate students' thoughts and feelings about their personal and academic experiences. They were told that the study

would begin once enough interested students had been recruited and that students would be asked to participate on day one, and each day thereafter. They were also provided information about associated activities, specifics surrounding participation, incentives for complete participation in the three-week study ($30), and eligibility requirements. While not specifically told about the number and nature of the three treatment conditions, the form stated that they may or may not be asked to participate in different activities (e.g., exercising, journaling). They were informed that while this was a mostly online study, that they may be asked to attend one of the four campus locations twice throughout the three-week period. They were also told that they would have a chance to participate in a three-month follow-up and that, for their participation, they would be entered into a raffle for a chance to win one of ten $25 gift cards.

Interested participants provided their consent to participate and were also asked to provided other demographic information in preparation for the start of the study. Given that the three-week study was conducted in the summer and the follow-up would be conducted in the fall, this online form asked students to confirm that they would be continuing as graduate students in the fall semester. Once students submitted the form, they were reminded that they would be contacted once enough interested participants were recruited with information about when this three-week study would commence and to remind them to participate on the first day to confirm participation in the study overall (i.e., reaffirming the time-sensitive nature of the study).

Throughout the recruitment period, various students emailed the first author to inquire about the study (e.g., how would they be paid, whether their names would be kept anonymous) and to ask specific questions about eligibility (e.g., would they be eligible if

they were going to be traveling abroad in the fall or only going to be taking only research credits and no classes). The author answered these questions and accepted students as eligible if they would be continuing as graduate students, even if they would be traveling in the fall (given that the follow-up was entirely online) or taking a reduced course load while completing research (theses, dissertations) in the fall semester as long as they were considered part-time students (i.e., taking at least six units or having gotten approval to make fewer research units equate with part-time status).

Within a three-week period, 255 eligible students indicated interest and provided informed consent. All eligible students were told that the study would began on June 1, 2016 and last through June 21, 2016 and that the follow-up would be in September. Some students emailed the author to state that they would be unable to participate in this timeframe. Others did not participate on the first day (taking the pre-test survey), and thus, were not eligible to continue per the study requirements. Thus, 234 participants began the study on the first day. At the end of the three-week period, 160 students completed the post-test (32% attrition) and were included in the post-test analyses. At the three-month follow-up, 117 students participated (27% attrition from post-test and 50% attrition from pre-test), and were included in the follow-up analyses (see Appendix E for complete participant demographic information for each wave of the study).

Interventions

The study consisted of three different conditions, each with a different protocol. They are the positive psychology intervention (PPI) group, the informative stress group, and the wait list control group.

PPI. The online PPI intervention was adapted for use as an online protocol from Achor's (2012, 2014) original version. Permission was sought before use (see Appendix G). This protocol consisted of engaging in one of five activities (3 grateful things; positive support network message; meditation; writing about a meaningful experience; and exercise) everyday for 3 weeks. Participants chose one activity from a list of five to engage in daily, and were advised to engage in each at least twice in the three-week period. The PPI Blackboard shell had instructions for completing each activity (see Appendix F for full protocol). Completion of all online activities were verified by the submission of assignments. Participants who missed 3 daily assignments, either consecutively or in total, were disqualified from the study. The physical exercise activity was verified by asking that students use one of four campus fitness centers, where student identification cards are swiped on entry. Fitness fees (usually $25) were waived to encourage participants' usage without incurring costs. The PPI intervention began the day of the pre-test and ended with the post-test on the 21st day.

Informative Stress. The informative comparison group was provided information on their BlackBoard shell about the sources and types of stress, its various effects, and positive coping mechanisms that can help individuals manage stress effectively. This group's protocol mirrored the PPI group in a number of different ways. Similar to the PPI group, participants in this group completed daily experiential exercises related to information about stress and stress management. Participants were given a choice of five lessons and instructed to complete one lesson of their choice everyday for 3 weeks. Having choice, exactly like the PPI group, decreased the chance that the availability of choice itself impacted well-being. They were asked to complete each

lesson twice in the three-week period, just like the PPI group. Participants who missed 3 daily lessons, either consecutively or in total, were disqualified from the study. While participants differed in how long they spent on the lesson they chose for the day, it generally took participants between 2-20 minutes a day to complete a lesson.

Rather than developing original materials, the resources for this group were intentionally gathered from various sources (see Appendix H for full protocol). The information in the lessons came from the available resources on wellness from the university's various service units (ASU Wellness and the Educational Resources from the Patient Portal). Permission from ASU was obtained (see Appendix I). Two videos found from online sources were also included to mirror the PPI group experience. Baghurst and Kelley (2014) note that the dissemination of information about stress and coping can be a useful mechanism for helping students combat stress. Universities invest in developing these resources and this intervention was developed in an effort to understand whether these available resources have the intended effect on students' perceptions of stress and their overall well-being. The Informative Stress intervention began the day of the pre-test and ended with the post-test on the 21st day.

Wait List. Participants in the wait list control group were only administered pre-, post-, and follow-up surveys (see Appendix J for full protocol). They were not engaged in any experiential exercises and did not receive any other information until the last day of the three-week intervention period. They were, however, paid the same amount as all participants for their participation and also invited to participate in the three-month follow-up. After the follow-up tests were administered, all participants in the wait list control group were informed that they were in the control condition and offered the

chance to participate in either the PPI or Informative Stress group protocols. There were four interested participants. Three indicated that they would like to complete the PPI course and one expressed interest in the Informative Stress course. These students were enrolled in the course and could view the various associated activities.

Measures

Pre- and post-surveys consisted of three measures and demographic questions. The three-month follow-up also included additional questions not originally asked. See below for more information about each measure and additional questions asked.

Perceived stress. Measuring graduate students' perceived stress is important given that it is these perceptions that shape their behaviors, whether they be health-promoting, or health-defeating (Rocha-Singh, 1994). Perceived stress was measured utilizing the self-administered Graduate Stress Inventory-Revised (GSI-R; Rocha-Singh, 1994; see Appendix K), a revision of the original GSI (Rocha-Singh, 1990). This instrument was specifically designed to capture how stressful various domains are perceived to be by graduate students at both the masters and doctoral level. These domains, which comprise the three subscales, include: academic stress (academic responsibility); family/monetary stress (family and financial responsibilities); and environmental stress (university environment). This specific version was chosen given its inclusion of items that weigh how students' diversity factors, such as gender and race/ethnicity, can influence their experiences throughout graduate school. Participants responded to each of the 20-items using a seven-point Likert scale ranging from "Not at all stressful" (1) to "Extremely stressful" (7), with a possible overall score ranging from

20 to 140. Sample prompts include: "Adjusting to the campus environment," "Handling relationships," and "paying monthly expenses."

Development of this instrument was founded upon research examining the social and psychological environment of graduate school (Rocha-Singh, 1994). This research includes work on undergraduate student stress (Mendoza, 1981) and cognitive appraisal theories of stress (Lazarus, 1966, 1977). The survey was developed and tested on samples of 816 diverse master's and doctoral level students in three different studies, with revisions being made using the data from each study (Rocha-Singh, 1994). Results from the revised version indicate that the three subscales of the GSI-R have moderate to high alpha coefficients for internal consistency (.78 for academic stress; .77 for family/monetary stress; and .85 for environmental stress). Test-retest reliability from a two-week period yielded high coefficients (.85 for academic stress; .85 for family/monetary stress; and .80 for environmental stress). Concurrent validity of the GSI-R was tested using the State-Trait Anxiety scale (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), with subscales having the following correlations: .45 for academic stress; .20 for family/monetary stress; and .45 for environmental stress. Thus, while perceived stress is associated with state-trait anxiety, this inventory is likely capturing a separate construct.

Happiness. Happiness was measured using the Steen Happiness Index (SHI; Seligman et al., 2005; see Appendix L), which was developed to identify changes in happiness over time, even among individuals who have high baseline scores for happiness. This index captures three distinct types of happiness: the pleasant life (experiencing and savoring pleasures); the engaged life (losing the self in engaged

activities); and the meaningful life (participating in meaningful activities). Given that this instrument discriminates among higher levels of happiness, it is intended for use with healthy and high-functioning individuals (i.e., non-clinical populations). The SHI is a self-administered, 20-item measure with each question presenting statements, ranging from negative ("I dislike my daily routine") to positive ("I like my routine so much that I almost never take breaks from it"). Negative to positive statements correspond with numbers (1-5) with 1 being negative and 5 being positive. The sum of these numbers is the total overall score, ranging from 20 to 100. The SHI has strong psychometric properties and was normed on a sample of several hundred adult respondents. It has demonstrated excellent internal consistency (Seligman et al., 2005), with a coefficient alpha of .95, and a test-retest reliability over one week (r = 0.97). While the SHI is highly correlated with other measures of happiness and wellbeing, it can better discriminate upward changes (Duckworth, Steen, & Seligman, 2005; Seligman et al., 2005; Simmons & Lehmann, 2013).

Resilience. Resilience was measured using the Resilience Scale for Adults (RSA; Froborg, Hjemdal, Rosenvinge, & Martinussen, 2003; see Appendix M). The RSA was developed to measure the various positive resources and protective factors that foster resilience and contribute to overall mental health (Friborg et al., 2003). The RSA is a self-administered, 33-item scale with six different domains: perceptions of self (6 items); perceptions of future (4 items); structured style (4 items); social competence (6 items); family cohesion (6 items); and social resources (7 items). Questions present an unfinished sentence (e.g., "I feel that my future looks"), and offer one negative ("uncertain) and one positive ("very promising") sentence completion at opposite ends of

a continuum of numbers from 1-5. Individuals choose the number in between the two poles that best describes how they would finish the sentence. Each question offers a unique sentence and responses. Also, to limit respondents from continuously replying in a similar manner, negative and positive pole placements are routinely switched. Scores range from 33 to 231, with higher scores being indicative of higher resilience. However, the questions where the number 5 corresponds with the negative pole are reverse scored. The RSA has strong psychometric properties. Estimates of reliability using Cronbach's alpha are as follows for each domain: perceptions of self ($\alpha = .83$); perceptions of future ($\alpha = .83$); structured style ($\alpha = .63$); social competence ($\alpha = .82$); family cohesion ($\alpha = .89$); and social resources ($\alpha = .80$; Froborg et al., 2003). Studies using the RSA (Stack-Cutler, Parrila, & Torppa, 2015) have found Cronbach's alphas ranging from .67 to .90, and four-month test-retest correlations ranging from .69 to .84. Construct validity was supported by positive correlations with similar measures and negative correlations with dissimilar measures (Froborg et al., 2003). In a review of 19 resilience measures, the RSA was considered one of the three overall best measures in terms of psychometric properties (Windle, Bennett, & Noyes, 2011).

Demographics. Demographics, including age, gender, race, program of study, and graduate level of study (masters versus doctoral student), were collected at the pre-test to test hypotheses and further examine the data (see Appendix N). At both post-test and follow-up, participants were asked to provide their student ASU ID numbers, ASUrites, and email addresses. These ID numbers and ARUrites allowed for matching up participants from pre-test to post-test and follow-up. At follow-up, participants were also asked three additional questions surrounding whether they had engaged in a number

of activities, such as meditation, exercise, journaling, psychotherapy, or relaxation exercises, prior to, during, and as a result of participating in the study (see Appendix O for additional questions). This information was used to conduct post-hoc exploratory analyses to determine whether various results might depend on the extent to which individuals were motivated to continue engaging in the activities related to the study after it was over. This information was also used to explore whether positive results could be due to other factors (e.g., participating in psychotherapy, engaging in regular physical exercise).

Procedures

The 234 participating students were randomly assigned to the three conditions (PPI, informative stress, and wait list) using an online random assignment generator. After assignment, analyses were conducted to ensure that there were no significant differences between the groups while maintaining randomization (see Appendix P for pre-analyses). Each group, which consisted of 85 students, was emailed separately to inform them of the study start date (June 1, 2016) and to review what they would be asked to do. Given the additional activities asked of the PPI and informative stress groups, these groups required additional administrative systems to present the activities and track daily participation. Thus, the PPI and informative stress groups were managed via Blackboard, an online educational system that is used to manage academic courses. Used by the university, this system was likely familiar to graduate students. Students were inputted into the "course" for their group using their student identification (ASUrites) and thus, had access to the main page of the website, or Blackboard shell. All intervention materials for the experimental and comparison groups were administered

using this online system. This system also allows for administrative announcements to be posted on the webpage, with an accompanying email sent to all users. This announcement system was used to remind participants in the experimental and comparison groups of the study start date and what they would be asked to complete on that first day (survey and daily activity). Those in the control group, without access to an online portal, were emailed directions for completing the survey on the first day.

On the first day of the study, all participants were invited to take online pre-tests, which included the three measures and the demographic questionnaire. Give that a few weeks may have passed between when students indicated interest and took the pre-test, the first page of the online pre-test was the informed consent page they had previously agreed to during the recruitment phase. While participants were not required to answer questions related to the measures, they were required to provide consent again in order to begin the pre-test. Thus, all participants electronically indicated that they had read and understood this information before completing the pre-test. Participants were also required to provide a few basic demographic variables (ASU ID, ASUrite, and email address) so that they could be tracked. Otherwise, all other questions were voluntary.

The intervention period lasted for 21 days. Experimental and comparison group participants' completion of activities was verified by the Blackboard system. This system allows assignments to be created, submitted, and graded, and also provided administrators information about when participants logged into the system, their specific activity, and the length of time they spent on the course website. Since exercising at one of the four ASU fitness centers was part of the PPI protocol, a specific external check was used to test participants' compliance of this particular activity. At the end of three-

week period, four random days were chosen and within those days, 10 participants who chose exercise as their day's activity were randomly selected. Those days were provided to the director of the fitness centers (SDFCs) who checked the students' identification numbers against the database of all fitness center users for that day. This external check of 40 total students was completed and revealed a 100% adherence rate, meaning that students who chose physical activity as their daily activity actually attended one of the four SDFCs on that day. In general, while participants differed in how long they spent on the activity they chose for the day, their chosen activity took them between 2-20 minutes a day to complete.

To encourage participation and discourage attrition as the study continued, all participants were incentivized for complete participation. Complete participation for the control group meant taking pre-test and post-test surveys. Complete participation for the experimental and comparison groups meant taking pre-test and post-test surveys as well as completing the daily activities for 21 days (and not missing more than 3 days consecutively or overall). For complete participation, students' ASU student identification cards were loaded with $30 and participants were notified that they could use this money to purchase goods throughout the four ASU campuses. One student complained about the form of payment and was incentivized with a $30 Visa gift card, which could be used like cash. At the end of the three-week study, participants were reminded that they would be contacted again in September for a three-month follow-up. To encourage participation, they were told that those who completed the follow-up survey would be entered into a raffle for a chance to win one of ten $25 Amazon gift cards.

Design and Analysis

This study was a randomized control trial comparing an online PPI with an online informative stress comparison group and a wait list control groups in a sample of graduate students. To determine the number of participants needed for this study, previous studies were reviewed revealing a range of effect sizes for PPIs from small to medium (Lyubomirsky et al., 2005). An apriori power analysis using G*Power 3.17 (Faul, Erdfelder, Buchner, & Lang, 2007) determined that 171 participants (n = 57 participants per group) was necessary to detect an effect size of .4 at a significance level of .05 and a power of .80. Studies similar to the current investigation utilize this same methodological rationale (Chiauzzi et al., 2008; Hintz & Meredith, 2014).

Several factors were taken into consideration when deciding about appropriate statistical analyses. There was one categorical independent variable (three different treatment groups: control, informative stress, and PPI) and three continuous dependent variables (perceived stress, happiness, and resilience). There were three assessment points or waves (pre-test, post-test, and at three-month follow-up). Since it was unclear whether demographic variables (age, gender, race, program of study, graduate level of study) would impact results, these variables were controlled for when analyzing group differences. To account for these potential influences, and to control for the five demographic covariates, data was analyzed using a Multivariate Analyses of Covariance (MANCOVA).

CHAPTER 4

RESULTS

Before testing specific hypotheses between waves, pre-analyses were conducted to ensure that necessary conditions were met (e.g., homogeneity of variance, normality, independence of errors, and homogeneity of covariance; see Appendix P for all pre-analyses results). Given that each person is participating in an online group individually, observations are independent of one another and thus, the assumption of independent random sampling was met, reducing Type 1 error. An ANOVA was performed on all covariates and dependent variables from the pre-test to check for pre-existing differences between the three groups (PPI, informative stress, and control). There were no significant differences between the three groups at pre-test. No significant differences were found between the treatment groups on any of the covariates, ensuring that the sample sorted evenly into the three treatment groups on the variables used in these analyses. In order to examine whether the assumption of normality was met for the MANCOVA analyses, skewness and kurtosis of the variables, were observed. According to Curran, West, and Finch (1996), as long as skewness is under 2.0, and kurtosis values are under 7.0, data can be assumed to be normal for multivariate tests. All values of skewness and kurtosis were under these ranges. Overall, pre-analyses confirmed that all conditions necessary for running a MANCOVA were present.

Overall Analysis Strategy

In order to test Hypotheses 1-6, a separate MANCOVA model was run for each outcome (perceived stress and its subscales; happiness; and resilience and its subscales), and for each of the separate time points. Each model predicted the outcome variable at post-test

or follow-up from treatment condition as the predictor, and controlling for five covariates (sex, age, ethnicity, graduate school level, year in graduate school). The outcome measure at pre-test was handled as a covariate in the model to account for baseline levels of each outcome variable. A contrast code was used to examine the effect of one group compared to the other two. The effect of treatment at post-test and follow-up were examined in separate MANCOVA models. Hypotheses 1 and 4 used the same MANCOVA model, but with a different contrast code to assess for the effect of the PPI and informative stress groups separately. The same was done for Hypotheses 2 and 5, and 3 and 6. Scale descriptives for all measures and groups at the three waves can be seen in table 3 of Appendix Q.

Hypotheses 1 and 4: Effect of Treatment on Perceived Stress

The first MANCOVA model examined the effect of the treatment on overall perceived stress. It was predicted in Hypothesis 1 that the PPI group would report lower perceived stress than the other two groups, and in Hypothesis 4 that the informational stress group would report lower perceived stress than the control group. The overall model was significant ($F(2, 151) = 15.92$, $p < .001$, *Adj.* $R^2 = .43$; see Table 1 in Appendix Q). While the model accounted for a large portion of the variance, this effect was driven entirely by the effect of perceived stress at pre-test ($B = .72$, $p < .001$). There was no overall effect of treatment on perceived stress at post-test ($F(2, 151) = 1.08$, $p = .34$). There was no significant difference between the PPI group compared to the informative stress ($B = 4.03$, $p = .20$) or control groups ($B = 0.16$, $p = .95$). There was also no difference between the informative stress group and the control group ($B = 3.87$, $p = .19$; see Table 2 in Appendix Q for a breakdown of means by treatment condition).

The next model examined the effect of treatment on overall perceived stress at follow-up, with the same predictions as the previous model. The overall model was significant ($F(2, 106) = 12.53$, $p < .001$, *Adj.* $R^2 = .45$). Like the post-test perceived stress model, the large amount of variance explained at the follow-up was accounted for entirely by the effect of perceived stress at pre-test ($B = .75$, $p < .001$). There was no overall effect of treatment on perceived stress at follow-up ($F(2, 106)$v=v 0.19, $p = .83$). There was no significant difference between the PPI group compared to the informative stress ($B = 0.64$, $p = .86$) or control groups ($B = 1.98$, $p = .56$). There was also no difference between the informative stress group and the control group ($B = -1.34$, $p = .69$).

Academic Stress. A model was also run to test each of the three subscales of perceived stress (academic, environment, and family). All models were significant, again with perceived stress at pre-test being responsible for much of the variance. In looking at academic stress at post-test, there was no overall effect of treatment ($F(2, 151) = 2.27$, $p = .11$). The PPI group did not significantly differ from the informative stress ($B = 1.31$, $p = .32$) or control groups ($B = -1.25$, $p = .27$). However, there was a difference in the informative stress group from the control group, such that the informative stress group reported higher academic stress than the control group ($B = 2.09$, $p = .04$).

This effect did not extend to the follow-up. There was no significant effect of treatment in predicting academic stress at follow-up, ($F(2, 151) = 0.05$, $p = .95$). The PPI group did not significantly differ from the informative stress ($B = 0.47$, $p = .76$) or control groups ($B = 0.31$, $p = .84$). Similarly, there was no difference between the informative stress and control group ($B = 0.16$, $p = .91$).

Environmental Stress. In examining environment stress, there was a significant effect of treatment at post-test in predicting environmental stress ($F(2, 222) = 8.10$, $p < .001$). The PPI group did not significantly differ from the informative stress group ($B = -2.12$, $p = .18$). However, the PPI group did report less environmental stress than the control group ($B = 5.02$, $p = .001$). The informative stress group also reported significantly less environmental stress than the control group ($B = -7.15$, $p < .001$).

None of these differences persisted into the follow-up. The PPI group did not significantly differ from the informative stress ($B = 0.11$, $p = .94$) or control groups ($B = 1.04$, $p = .50$). The informative stress group ($B = -0.92$, $p = .54$) also did not differ from the control group.

Family Stress. There was no significant effect of treatment in predicting family stress at post-test ($F(2, 151) = 0.18$, $p = .84$). There was also no significant difference between the PPI group and either the informative stress ($B = 0.58$, $p = .57$) or control group ($B = .39$, $p = .66$). Similarly, the informative stress group did not significantly differ in family stress from the control group ($B = 0.19$, $p = .84$).

Results for the follow-up paralleled the post-test. There was no significant effect of treatment in predicting family stress at follow-up ($F(2, 151) = 0.54$, $p = .56$, *Adj.* $R^2 = .43$), with no significant differences between the PPI group and either the informative stress ($B = 0.43$, $p = .71$) or the control group ($B = 1.13$, $p = .31$). The informative stress group did not significantly differ in family stress from the control group ($B = -0.70$, $p = .52$).

Overall, Hypothesis 1 was supported in the domain of environmental stress at post-test, but this effect did not hold at the follow-up. Hypothesis 4 was supported in the

domain of environmental stress, but had the opposite effect in academic stress. These Hypothesis 4 effects were not present at the follow-up. Neither type of treatment seemed to reduce family or overall perceived stress at either post-test or follow-up.

Hypotheses 2 and 5: Effect of Treatment on Happiness

The next MANCOVA model examined the effect of treatment on happiness. It was predicted in Hypothesis 2 that the PPI group would report higher happiness than the other two groups, and in Hypothesis 5, that the informative stress group would report more happiness than the control group. Similar to the perceived stress model, this overall model was also significant ($F(8, 151) = 43.12$, $p < .001$, *Adj.* $R^2 = .68$). As before, this effect was driven entirely by including happiness at pre-test ($B = .98$, $p < .001$). There was no significant effect of treatment in happiness at post-test ($F(2, 151) = 1.59$, $p = .21$) indicting that the three treatment groups did not differ from each other in happiness at post-test. There was no significant difference in happiness in the PPI group compared to the informative stress group ($B = 0.29$, $p = .87$) or the control group ($B = -2.19$, $p = .15$). There was also no significant difference in perceived stress in the informative stress group compared to the control group ($B = 2.48$, $p = .13$).

When looking at the model predicting happiness at the follow-up, there was still no overall effect of treatment ($F(2, 106) = 1.40$, $p = .25$). The individual contrasts confirmed that there was no significant difference in happiness in the PPI group compared to the informative stress group ($B = -3.12$, $p = .18$) or the control group ($B = -3.41$, $p = .12$). There was also no significant difference in happiness in the informative stress group compared to the control group ($B = 0.29$, $p = .90$). Overall, Hypotheses 2 and 5 were not supported at post-test or follow-up.

Hypotheses 3 and 6: Effect of Treatment on Resilience

The next MANCOVA model examined the effect of treatment on resilience. Hypothesis 3 predicted that the PPI group would report higher resilience than the informative stress and control groups, and in Hypothesis 6, that the informative stress group would report more resilience than the control group. When predicting resilience at post-test, the overall model was significant ($F(8, 159) = 54.64$, $p < .001$). While, this was partly driven by including resilience at pre-test as a covariate ($B = .90$, $p < .001$), there was an overall effect of treatment ($F(2, 151) = 4.74$, $p = .01$). In order to determine which groups differed, the planned contrasts were run to test Hypotheses 3 and 6. There was a marginally significant difference in resilience in the PPI group compared to the informative stress group, such that the PPI group had directionally higher resilience than the informative stress group ($B = -3.82$, $p = .10$). The PPI group also had significantly higher resilience than the control group ($B = -6.30$, $p < .001$). There was no significant difference in resilience in the informative stress group compared to the control group ($B = 2.48$, $p = .26$).

When examining resilience at the follow-up, differences between treatment groups disappeared ($F(2, 106) = 1.22$, $p = .30$). There was no significant difference in overall resilience in the PPI group compared to the informative stress group ($B = -1.89$, $p = .48$), or compared to the control group ($B = -3.92$, $p < .12$). There was no significant difference in resilience in the informative stress group compared to the control group ($B = 2.03$, $p = .42$).

Resilience Subtypes. Because the resilience scale contained several subscales, a separate MANCOVA was run to examine the effects of treatment on different aspects of

resilience (self perception, future planning, social competence, family cohesion, social resources, and structured style). Overall, there was no main effect of treatment in predicting perceptions of self-resilience at post-test ($F(2, 151) = 2.29$, $p = .10$). While there was no significant difference between the PPI group and the informative stress group ($B = -0.27$, $p = .68$), there was significantly higher self-resilience in the PPI compared to the control group ($B = -1.14$, $p < .05$). The informative stress group did not significantly differ in self-resilience from the control group ($B = 1.14$, $p = .15$).

When looking at resilience about planning in the future, results approached but did not reach the .05 significance level for the effect of treatment in predicting future resilience at post-test ($F(2, 151) = 2.66$, $p = .07$). The PPI group had significantly higher future resilience than both the informative stress group ($B = -0.85$, $p = .04$), and the control group ($B = -0.69$, $p = .06$). The informative stress group did not significantly differ in resilience from the control group ($B = -0.17$, $p = .66$).

When examining the effect of treatment at the follow-up, there was a significant main effect of treatment in predicting planned future resilience ($F(2, 106) = 3.55$, $p = .03$, *Adj.* $R^2 = .61$). The PPI group had significantly higher future resilience than the informative stress group ($B = -1.06$, $p = .02$), but not the control group ($B = -0.02$, $p = .97$). The informative stress group also had significantly higher self-resilience compared to the control group ($B = -1.04$, $p = .02$).

For social competence resilience, there was no effect of treatment in predicting social competence resilience at post-test ($F(2, 151) = 1.93$, $p = .15$). The PPI group did not significantly differ from the informative stress group ($B = -0.78$, $p = .21$). However, the PPI group did have marginally higher social competence resilience than the control

group (B = -1.04, p = .05). The informative stress group did not significantly differ in self-resilience from the control group (B = 0.27, p = .65).

When examining family cohesion resilience, there was an effect of treatment in predicting family resilience at post-test (F(2, 151) = 6.07, p < .01). The PPI group did not significantly differ from the informative stress group (B = -0.90, p = .15). However, the PPI group did have higher social competence resilience than the control group (B = -1.89, p < .001). The informative stress group did not have higher family resilience than the control group (B = 0.99, p = .09). See Table 2 in Appendix Q for means.

Overall, there was no effect of treatment in predicting social resources resilience at post-test (F(2, 151) = 0.63, p = .54). The PPI group did not significantly differ from the informative stress group (B = -0.14, p = .98) or the control group (B = -0.61, p = .33). The informative stress group did not differ from the control group (B = 0.24, p = .62).

There was no overall effect of treatment in predicting structured style resilience at post-test (F(2, 151) = 2.20, p = .12). The PPI group had marginally higher structured style resilience than the informative stress group (B = -0.90, p = .05). However, the PPI group did not have higher structured style resilience than the control group (B = -0.59, p = .13). The informative stress group also did not differ from the control group (B = -0.31, p = .46).

Overall, there was some support for Hypothesis 3 when looking at resilience related to future planning (F(2, 106) = 3.55, p = .03, *Adj.* R^2 = .61)., and family cohesion (F(2, 151) = 6.07, p < .01) at post-test. At follow-up, the only differences between treatment groups that lasted were a significant increase in planned future resilience for the PPI group compared to the informative stress group (B = -1.06, p < .01).

For Hypothesis 6, the informative stress group did not receive a benefit in resilience compared to the control group for the post-test or follow-up. There was an increase in planned future resilience for the informative stress group compared to the control group at follow-up (B = -1.04, $p < .01$), even though this difference did not show up at post-test.

Hypothesis 7: Testing the Moderating Effect of Program Type

In order to test whether there was an effect of program type, the same MANCOVA models were re-run, but with an added interaction term between treatment and psychology program status. Once the interaction term was examined, individual contrasts compared those in psychology-based programs to those not in psychology-based programs within each treatment type. Hypothesis 7 proposed that students from non-psychology-based programs would benefit the most from the PPI and informative stress treatments. The overall moderating effect of program type on total perceived stress approached but did not reach significant ($F(2, 148) = 2.90$, $p = .06$). Program type did not make a significant difference in the informative stress ($p = .64$), or control ($p = .32$) groups. See Table 4 in Appendix Q.

When examining the effect of program type at follow-up, there was still no significant interaction between treatment and program type ($F(2, 103) = 0.85$, $p = .43$). None of the individual contrasts showed a significant difference in program type: PPI ($p = .62$), informative stress ($p = .89$), and control ($p = .11$).

There was an overall moderating effect of psychology-based program on happiness ($F(2, 148) = 3.99$, $p = .02$). Contrasts revealed that this was driven by the PPI group ($F(1, 148) = 3.11$, $p = .08$) where those in psychologically-based programs

reported more happiness, than those in non-psychologically-based programs (see Table 5 in Appendix Q). Program type did not make a significant difference in the informative stress (p = .60), or control (p = .51) groups.

At follow-up, the interaction between treatment and program-type was not significant (F(2, 103) = 1.82, p = .17). The individual contrasts were also not significant for each of the treatments: PPI (p = .37), informative stress (p = .42), and control (p = .52).

For overall resilience, there was no moderating effect of psychology-based program on resilience (F(2, 148) = 2.01, p = .14). Individual contrasts within each program showed no difference between the two program types within the PPI group (p = .71), informative stress group (p = .41), or the control group (p = .92; see Table 4 in Appendix Q for means).

At follow-up, there was still no moderating effect of program type on resilience (F(2, 103) = 0.07, p = .93). None of the individual contrasts were significant for any of the treatments: PPI (p = .71), informative stress (p = .97), and control (p = .97).

While there were significant results related to Hypothesis 7, they were different than had been conceptualized. The students in the psychologically-based programs received more benefit from the treatments than did the students in the non-psychologically-based programs.

Follow- up Questions

At the follow-up, participants were asked if they had engaged in any of the activities included in the PPI group before the study started. A sum of the number activities (out of five total) participants engaged in before the study started was included

as a covariate. It was not a significant predictor in any of the analyses, and did not affect any of the results. Participants were also asked to what extent they engaged in any of the five activities since the post-test. The most frequent activity participants engaged in since the study was exercise, with the least common being relaxation techniques (see Table 5 in Appendix Q for specific frequencies). Participants were also asked whether they had incorporated any of the five activities into their lives. Out of the 117 participants who completed the follow-up, 65 (55%) reported that they had incorporated at least one of the activities into their life at least once a week with 26 (47%) of those participants being in the PPI group. Roughly 44% of participants responded that they had not incorporated any of these activities from the treatment into their lives. For most of the participants, the activity they incorporated most into their life afterwards was physical exercise.

CHAPTER 5

DISCUSSION

The results indicated that Hypotheses 1, 2, 4, 5, 6, and 7 were unsupported. Students in the PPI group did not report overall lower levels of stress or higher levels of happiness than the informative stress or control groups. While there were some significant findings in the subscales of the perceived stress and resilience measures, no overall effects were found and any effects found at pre-test did not persist into the follow-up. In all, only Hypothesis 3 were partially supported. For Hypothesis 3, students in the PPI group reported significantly higher levels of resilience at post-test than students in the informative stress or control groups. However, these results disappeared at follow-up. Additionally, for Hypothesis 7, there was an overall moderating effect of program on happiness. However, it was different than what was expected. The students in psychologically-based programs reported higher levels of happiness as a result of the treatment than those in non-psychologically based programs. This was mostly accounted for by differences in the PPI group, meaning that much of the change was accounted for by the students from psychologically-based programs in the PPI group receiving more benefits than those in non-psychologically-based programs in the PPI group. However, there was no moderating effect of program type on resilience. Again, these results did not continue to the time of the follow-up. Below, I will discuss the results, with specific attention to potential reasons why some hypotheses were or were not supported by the findings.

While much previous literature suggests that engaging in activities such as gratitude exercises, journaling, connecting to social support, meditating and exercise have

positive physical and psychological benefits, there are number of reasons why this investigation may not have yielded more significant effects on students' perceived stress and happiness. First, one of the reasons why several hypotheses in this study were unsupported could be because this study did not give participants enough time to fully incorporate the new behaviors into their routine that have been shown to impact wellbeing (see Lyubomirsky, King, & Diener, 2005; Seligman et al., 2005). In a study by Lally, van Jaarsveld, Potts, and Wardle (2010), 96 participants engaged in one daily behavior for 12 weeks. Results indicated that people typically take between 18-254 days to make a lasting behavior change. On average, it took individuals 66 days to make one behavioral modification. The 21 days of this study may have been too short to make a behavior change. Making such a behavioral change is integral to reaping the benefits of those behaviors. Additionally, beyond the time constraints of the study, participants were given five choices for a daily activity. Having five choices could have complicated the consistency needed to change behavior and could have diluted the potential impact of any one of these choices if practiced consistently for the entire study period. Lally et al.'s study did, however, emphasize that missing one opportunity to perform the daily behavior did not automatically weaken the habit formation process. Thus, even with several activity choices and not practicing each activity consecutively, a longer study period may have helped participants create multiple behavioral changes that could yielded positive effects.

Time may be one important factor in incorporating a new behavior into one's routine. However, a longer experimental period may not have yielded more significant results. The high level of attrition suggests that some participants could not stay with the

21-day commitment. This will be discussed more in the Limitations section. Here, I will try to elucidate some of the other factors of change. Much research points to the importance of commitment, self-efficacy, and overall stages of change in determining whether participants engage in, adhere to, or maintain an exercise regime (Courneya, 2010; Phillips, & Gardner, 2016; Rose, Parfitt, & Williams, 2005; Wadsworth, & Hallam, 2007). In a study by Phillips and Gardener (2016), researchers sought to investigate whether the strength it takes to initiate an exercise habit (instigation habit) could be differentiated from execution habit and hypothesized that instigation habit strength would be most predictive of future exercise and also reflective of long-term behavior change in exercise habits. Indeed, their work found that exercise instigation habit was the only unique predictor of exercise frequency. These results align with another study that seems relevant to this current investigation. Simonavice and Wiggins (2008) explored college students' perceptions of self-efficacy as well as barriers to engaging in exercise. They found that students who already engaged in exercise perceived fewer barriers to exercise than those who did not exercise or only exercised sporadically. Thus, those who already exercise may see themselves as more capable of engaging in an exercise routine and perceive fewer barriers to this behavioral change. Additionally, they may more easily form the instigation habit strength, due to greater self-efficacy and lower perceived barriers, which could be essential to creating actual behavioral change.

Simonavice and Wiggins (2008) also assessed for students' stage of change. According to the transtheoretical model, individuals' self-efficacy and perceived barriers are moderated by where they are in terms of commitment to making a change. Those who are pre-contemplating making a change do not feel as capable and perceive greater

barriers to engaging in exercise than those who are farther along in the stage of change. Similarly, other studies (Bogg, 2008; Wallace, Buckworth, Kirby, & Sherman, 2000) found that individuals' stage of change could directly impact whether they believe they can change (self-efficacy) and whether they actually attempt to change (reported action). These studies also examined other individual differences that could influence behavioral change. In a study with 937 undergraduate students, Wallace et al. (2000) found that exercise self-efficacy and history of engaging in physical activity history were significant predictors of the stage of exercise behavior change for participants. They found that among female participants, exercise self-efficacy and family social support for physical activity were the best predictors of stage of exercise behavior change while for male participants, social support from friends, physical activity history, and exercise self-efficacy were significant predictors of stage of exercise behavior change. Thus, there might be different motivating factors at play for different genders when it comes to self-efficacy. In Bogg's (2008) study with 566 college students and community members, personality factors directly influenced where participants were in the stages of change according to the transtheoretical model. For example, Bogg found that consciousness-related traits, particularly industriousness or being hard-working, predicted participants' stage of change. He suggested that future studies look more closely at the role of individual personality traits in determining differences in self-efficacy and behavior change.

Taken collectively, these studies highlight the intricate mechanisms that could be at play in determining participants' commitment to behavioral change and their success therein. There are a complexity of factors involved in whether individuals make

behavioral change including: their beliefs about their ability to engage in a behavior, their commitment to starting and continuing with the behavior, and whether they maintain the behavior even after they have begun. Furthermore, personality, gender, and other individual differences may influence what motivates individuals to engage in or continue with newly incorporated behaviors. In the context of this current investigation, especially given the variety of activities in which individuals could engage, it may be that participants did not experience the conditions necessary to facilitate behavioral modifications. Again, making behavioral change, even when the focus of change is singular, seems to be a difficult task with a number of influencing variables that were not adequately addressed in this current investigation.

Turning to the significant results, self-efficacy and behavioral habit formations may also help to explain why students in the psychologically-based programs reported more benefit than those in non-psychologically-based programs. Originally, it was hypothesized that students who had not received any interventions related to wellbeing and stress would be most impacted by participating in the treatment conditions. However, given the aforementioned discussion about the length of time, level of commitment, and belief in one's self that could contribute to impactful behavioral changes, it may be that those students who have already received a foundation in the content presented in the treatment conditions benefited the most. For example, scholarship in learning theory (Hengst, Duff, & Dettmer, 2010; Wogan, 1959) suggests that engaging in meaningful, repetitive behaviors, could be critical for making changes in knowledge and behavior. Thus, students from psychologically-based programs who potentially already had a foundational understanding of the importance of self-care, stress

management, and some of the benefits of the activity choices in the treatment studies, may have been able to build upon their pre-existing schemas and information.

Given the multiple influencing factors in adhering to any behavioral changes, the significant results found in this investigation become especially important to understanding how to support graduate students' wellbeing. Results indicated that students in the PPI group reported higher levels of resilience compared to the informative stress and control groups. Popular definitions of resilience highlight that it is an adaptive quality in the face of stress or difficulty (APA, 2016). Resilience is the ability to cope, persevere, and adapt in the face of adversity. Resilience may be most important among the outcome measures. Some researchers (Herman, Maroun, & Richter-Levin, 2015; McGonigal, 2015) assert that perceived stress levels are far less important than individuals' beliefs about the impact of stress. McGonigal (2015), for example, espouses that gathering information about individuals' stress levels is incomplete if we do not also investigate how they think this stress level, regardless of its level, is impacting them or how well they feel equipped to handle the challenges that their current stress presents.

In my study, the perceived stress of participants may be less important than their beliefs about whether stress can be useful or whether they can handle the stress they have. Resilience specifically taps into individuals' ability to adapt and to cope with adversity. Thus, while participants' reported stress level did not change at the end of the study, the change in resilience suggests that participants' relationship to their perceived stress may have shifted. There is some support that resilience can act as a direct buffer for the usually negative impact of workplace stress (Grant & Kinman, 2012). Lee et al. (2013) make a strong case for resilience also being significantly related to self-efficacy and self-

esteem. In a study by Cassidy (2015), students' academic self-efficacy was a significant predictor of academic resilience. Individuals in my study seem to have built resilience in the face of stress. This same phenomenon may have also occurred with measures of happiness. While participants' self-reported levels of happiness may not have been significantly impacted because of their participation in the experimental conditions, the fact that resilience was significantly impacted may be explained by a shift in how they relate to their own happiness. Participants' reported levels of stress or happiness may be less important than their self-efficacy about their ability to handle whatever they are experiencing.

Additionally, ecological systems theory (Brofenbrenner, 1979) posits that resilience can be impacted by environmental factors. Environmental stress was the one subtype in the Graduate Stress Inventory-Revised (GSI-R) that was significant for the PPI group at post-test, meaning that students in the PPI group felt significantly lower levels of environmental stress after completing the intervention. One possible explanation for this could be that some of the exercises in the PPI protocol asked participants to be more mindful of their day and their surroundings. They were asked to journal about positive experiences, express gratitude for three things from that day, write a note to someone in their support network, or engage in two minutes of meditation. Each of these activities requires a greater attunement and connection to one's environment in a positive way. In being more aware of themselves and their surroundings and connecting to their environment in a positive way, participants in this group may have been more inclined to feel resilient in the face of environmental stresses. This particular finding could be useful

in thinking about how to bolster students' perceptions of their environmental stresses and more so, their interactions with this environment.

Limitations

It is important to highlight some of the study limitations that may have influenced the results. For one, apriori analyses determined that 171 participants would be necessary to detect effect sizes appropriate for this scholarship. While the study began with 234 students, attrition rates rendered the sample sizes at the time of the pre-test and the follow-up at less than desired. The study began in the summer, when many students are traveling, focused on areas other than their academics, and otherwise less connected to the university and their roles as students. The timing of the study could have impacted why students showed initial interest but did not continue. It could explain why students may have had a hard time with following through on completing daily assignments. Most of the students who dropped out of the study were in the treatment conditions, suggesting that those groups were most impacted by the timing of this study. Lastly, all students in the study began in the summer but participated in the follow-up in the fall. Beginning and following-up with the study at roughly similar times could have minimized any influences from the differences between semesters. For example, students in the summer may experience far different levels of perceived stress, happiness, or resilience than they might in the middle of the fall semester when classes and other responsibilities are underway.

Additionally, the demands of the daily interventions for the PPI and informative stress conditions may have been too much of a commitment for some students. Students may have been less motivated to complete daily activities, even when incentivized. Also,

the fact that the PPI protocol contained an in-person component may have presented a challenge to some students who would have preferred an entirely online intervention. While the students who did choose to work out on any given day were verified as having completed the activity, these students may have already been engaged in exercise. In other words, the in-person component of the exercise activity may have presented an additional barrier for students who may not have already been engaged in exercise. Having a way to verify exercise without an in-person component may have yielded stronger results.

Implications and Future Directions

Reducing graduate students' stress while increasing their happiness and resilience is an important endeavor with benefits for not only graduate students themselves, but for all with whom they work (i.e., faculty, staff, undergraduate students). The results of this study illustrate that resilience can be built in as little as three weeks. While these positive results did not continue into the follow-up, they might have if students had continued to engage in the behaviors outlined in the PPI. Future research should examine other ways to help students maintain their resilience. Perhaps a longer intervention or having the support of advisors and mentors could positively impact the attainment of resilience.

The results of this study also highlight the importance of talking about perceived stress, resilience, and social support with graduate students. Explicit conversations about the real impact of these variables on students' success can prompt collective action to helping students to become more resilient in the face of stress as well as happier and healthier throughout their programs. Mentors and faculty members should address students' social supports throughout their program. Mentorship programs can help

students to support one another. Additionally, mentors should speak to students about the resilience necessary to succeed in a graduate program. The skills and activities from the treatment conditions in this study could easily be taught in courses, brown bags, graduate student events, and professional development functions.

While information about stress is a start, the results of this study highlight that giving students information about stress does not directly lead to actions that improve students' wellbeing. Stress management is a start but providing students with actual skills to combat stress, differentiating between motivating and debilitating stress, and developing healthy habits that bolster wellbeing regardless of stress level are also important.

Additionally, while this study used the university's academic platform BlackBoard to facilitate the interventions, future studies should continue to investigate online platforms that could be useful for the dissemination of PPIs. Having accessible, online interventions can be convenient for graduate students who need these skills but lack flexibility in their packed schedules. More sophisticated online platforms can embed guided meditations, exercise videos, and other interactive functions that can help ensure compliance with activities while reducing barriers for engagement (e.g., going to campus or linking to an outside source).

Future research might also examine the specific amount and type of behavioral activation needed to motivate commitment to and maintenance of behavioral change (e.g., participating in a daily activity). Given that many students reported not engaging in the behaviors learned from their interventions, it might be helpful to qualitatively investigate the reasons why some students continued with these behaviors and others did

not. The understanding of these factors is necessary for the creation of successful interventions.

Lastly, to optimize busy graduate students' time, future studies might consider combining PPI elements into one activity. For example, developing exercise partnership groups for graduate students could combine exercise with social support or yoga groups could simultaneously combine meditative elements with exercise and social support. These simultaneous PPI activities might yield more potent results than single daily activities.

Conclusion

Growing numbers of students are entering graduate programs each year (Allum & Okahana, 2015; NCES, 2013) and graduate students play a critical role in the university system at large with their creation and dissemination of knowledge. However, the many roles and responsibilities they hold negatively impacts their ability to engage in activities that maintain various aspects of their wellbeing (Mazzola, Walker, Shockley, & Spector, 2011; Myers et al., 2012; Rocha-Singh, 1994). Thus, many graduate students experience high levels of stress and negative mental health (ACHA, 2014; Wyatt & Oswalt, 2013). Despite graduate students' importance to and within the University system and their vulnerability to living unbalanced, unhealthy lives due to their demanding schedules, little previous research has focused on developing interventions for them as a specific population. My study was the first to combine a multicomponent positive psychology intervention (PPI) with an online format in the service of graduate students. It was also the first to compare a PPI with a stress management intervention, which is far more readily disseminated in higher education. While students' perceived stress and reported

happiness did not change as a result of participating in the PPI intervention, their resilience was significantly impacted. Previous research suggests that resilience might be one of the most important qualities related to positive mental health and wellbeing (APA, 2016; Carle & Chassin, 2004; Fletcher & Sarkar, 2013; Lee et al., 2013; Mitchell, Vella-Broderick, & Klein, 2010). While the stress and less than optimal levels of happiness experienced by graduate students may be unavoidable, this study indicates that resilience despite the temporary difficulties experienced by graduate students, can be built and strengthened as a result of direct intervention. Additionally, merely providing stress management programs or information are not sufficient for creating such change. Higher education is a positive asset for entire communities, helping to train the next generation of leaders. There is a ripe opportunity for using the resources available in academia for helping graduate students to develop the resilience they need to live healthy and happy lives. This study presents a small foray into the wealth of possibilities for PPI interventions for graduate students. Results suggest that pursuing the development of these interventions is a worthwhile task, for graduate students, university systems, and communities at large.

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APPENDIX A

IRB APPROVAL: EXPEDITED REVIEW

Dear Richard Kinnier:

On 5/23/2016 the ASU IRB reviewed the following protocol:

Type of Review:	
Title:	The Happiness Project: A Randomized Control Trial of an Online Positive Psychology Intervention for Graduate Students
Investigator:	Richard Kinnier
IRB ID:	STUDY00004364
Category of review:	(7)(b) Social science methods, (7)(a) Behavioral research
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• IRB_Measures.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • IRB Consent Form_General.pdf, Category: Consent Form; • IRB Recruitment Script.pdf, Category: Recruitment Materials; • IRB_Participant Instructions.pdf, Category: Participant materials (specific directions for them); • IRB Application.docx, Category: IRB Protocol;

The IRB approved the protocol from 5/23/2016 to 5/22/2017 inclusive. 3 weeks before 5/22/2017 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 5/22/2017 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,
IRB Administrator
cc: Pauline Venieris

APPENDIX B

NEWSLETTER BLURB

Want to get $30 to participate in GPSA's 21-day research study with a three-month follow-up about graduate students' personal and academic experiences? Click here* for more information

*hyperlinked so that when clicked, students were taken to the online form where they were provided complete information, consented to participation, and provided demographic information; see Appendix D for online form).

103

APPENDIX C

RECRUITMENT EMAIL

I am a graduate student under the direction of Professor Kinnier in the Counseling and Counseling Psychology Department at Arizona State University. I am conducting a research study, sponsored by the Graduate and Professional Student Association, and approved by the ASU IRB (STUDY00004364), to explore the factors influencing graduate students' thoughts and feelings about their personal and academic experiences.

I am recruiting ASU graduate students to take part in a three-week study and a three-month follow-up. To participate you must:

-Have been an ASU graduate student during the spring 2016 semester

-Be continuing as a graduate student in Fall 2016 to participate (i.e., no recent graduates or students who will graduate in August).

You will be compensated $30 for your complete participation.

To find out more information and acknowledge your desire to participate, please fill out the following form. Once enough participants have been recruited, the study will begin. The study will begin once enough participants have been recruited. You will be contacted via email with information on when the study is going to begin and additional instructions for participation.

If you have any questions concerning the research study, please email the researchers at kinnier@asu.edu or pauline.venieris@asu.edu or call us at (xxx) xxx-xxxx.

Thank you in advance.

Pauline Y. Venieris, M.A., M.M.F.T.

Counseling Psychology Doctoral Candidate

APPENDIX D

ONLINE FORM

Informed Consent

Title of research study
GPSA Research Study

Investigators
Richard Kinnier, Ph.D. and Pauline Venieris, M.A., M.M.F.T.

Why am I being invited to take part in a research study?
We invite you to take part in a research study because you are a current and continuing graduate student at Arizona State University (ASU) who is at least 18 years old.

Why is this research being done?
We are conducting this research study to understand more about the factors that influence graduate students' thoughts and feelings toward academic and personal experiences.

How long will the research last?
This is a three-week study where different individuals will be asked to engage in different activities. This means that you may be filling out surveys on day one and day 21 (10-20 minutes) of the study or you may be engaging in a variety of online activities (2-10 minutes) on BlackBoard related to stress and well-being. All participants will be contacted 3 months after the study to fill out follow-up surveys.

How many people will be studied?
We expect about 250 people to participate in this research study

What happens if I say yes, I want to be in this research?
If you agree to participate in this research study, a number of things may happen.

You may be asked to take short online surveys about your thoughts and feelings about various aspects of your personal and professional life. These surveys will be taken on day 1 of the study, on day 21 of the study, and on a three-month follow-up day.

You may be asked to take the above short online surveys on days 1 and 21 of the study and also enrolled in a Blackboard course using your ASUrite. In this course, you will be directed to participate in short, online activities during the three-week time period. These activities could include: writing down 3 things you are grateful for; writing about a positive experience you have had in the last 24 hours; writing a positive message to someone in your social support network; exercising for 10 minutes; meditating for 2 minutes; reviewing lessons about the sources and types of stress, its various effects, and positive coping mechanisms that can help individuals manage stress effectively. You will have a choice of which activity to complete each day and should complete each activity at least twice during the three-week period. You may be asked to exercise at one of the four ASU Sun Devil Fitness Complexes (SDFC) so that this activity can be verified. Fees

associated with using the SDFCs during the summer ($25) will be waived during the duration of the study so you can use these centers free of charge.

Once the three-week study is over, all individuals will be contacted again in 3 months to participate in filling out online surveys once.

You are free to decide whether you wish to participate in this study.

What happens if I say yes, but I change my mind later?
You can leave the research at any time and it will not be held against you.

Will being in this study help me in any way?
You will be receiving $30 for your complete participation. Complete participation will be different depending on the tasks you were asked to complete during the study. For some, this means taking the surveys on day 1 and day 21. For others, it means taking the surveys on day 1 and day 21, as well as completing the activity of your choice daily for 3 weeks.

At the three-month follow-up, all individuals will be contacted to complete follow-up surveys. At this time, you will be asked if you want to be entered into a raffle to win one of ten $25 gift cards after you complete the short online survey.

Other benefits may include a waiver for fees ($25) to use the SDFC facilities during the three-week study period. Other possible benefits include getting to participate in activities that are related to personal and academic wellness and that could help you learn about how to manage stress.

Is there any way being in this study could be bad for me?
Since you may be asked to exercise at least twice (for 10 minutes) during the three-week study, there might be risks associated with this activity. Please choose a physical activity that matches your ability. If you experience any chest pain, dizziness, or pain during exercise, you should stop immediately. If you have been told by your doctor that you should only do physical activity recommended by a doctor, you should consult them prior to undertaking any physical exercise.

What happens to the information collected for the research?
The results to your surveys will be collected as well as your completion of the daily activities, if you are assigned them. Your results will be de-identified and a master list will be destroyed immediately after linking. Efforts will be made to limit the use and disclosure of your personal information, including research study records, to people who have a need to review this information. We cannot promise complete secrecy. The results of this study may be used in reports, presentations or publications but your name will not be used.

What else do I need to know?
This research is being funded by the ASU Graduate and Professional Student Association (GPSA).

Who can I talk to?
If you have questions, concerns, or complaints, talk to the research team at kinnier@asu.edu or pauline.venieris@asu.edu.
This research has been reviewed and approved by the Social Behavioral IRB (STUDY00004364). You may talk to them at (480) 965-6788 or by email at research.integrity@asu.edu if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research participant.
- You want to get information or provide input about this research.

The above information has been explained to me and all my current questions have been answered. To indicate my agreement to participate in this research study, and to verify that I am at least 18 years old, and an active, continuing ASU graduate student (i.e., NOT recently graduated and not graduating in August 2016), I consent to participate in the study by clicking "I agree" below.
□ I agree

Demographic Information

Name
ASU ID
ASUrite
Email
Program of Study

I was an ASU graduate student in the Spring of 2016 and will continue to be an ASU graduate student through the Fall of 2016. This means I did not just graduate and will not be graduating in August.

□ yes, I verify that this is true

I will be able to participate in this 21-day online study over the summer break. However, I understand that I MAY be asked to visit campus twice throughout this period.

□ yes, I agree

APPENDIX E

PARTICIPANT DEMOGRAPHICS

Table 1

Participants

	PPI	Informative Stress	Control	Total
Pre-test	78	78	78	234
Post-test	50	40	70	160
Follow-up	37	43	37	117

Table 2

Participant age

	Mean	Range	Standard Deviation
Pre-test	28.4	20-53	6.21
Post-test	28.25	21-53	6.15
Follow-up	28.9	21-53	6.8

Table 3

Participant gender

	Pre-test	Post-test	Follow-up
Male	97	61	31
Female	133	95	82
Transgender	3	3	3
Other	1	1	1
Total	234	160	138

Table 4

Participant ethnicity

	Pre-test	Post-test	Follow-up
African American	4	2	2
Asian American	19	15	14
Caucasian/White	107	82	61
Latino/a/Hispanic	31	13	10
Native American	3	2	2
Biracial/Multiracial	8	6	5
Other	62	40	23
Total	234	160	117

Table 5

Participant campus location

	Pre-test	Post-test	Follow-up
Tempe	181	124	92
Downtown Phoenix	34	22	18
West	5	3	2
Polytechnic	12	11	5
Online	2	0	0
Total	234	160	117

Table 6

Participant grade level

	Pre-test	Percent	Valid Percent
Masters	115	56	34
Doctoral	115	101	80
Professional Degree	4	3	3
Total	234	160	117

Table 7

Participant year in program

	Pre-test	Post-test	Follow-up
1st year	104	68	56
2nd year	47	42	25
3rd year	26	16	14
4th year	19	17	12
5th year	17	9	4
6th year or higher	21	8	6
Total	234	160	117

Table 8

Participant discipline

	Pre-test	Post-test	Follow-up
Architecture & Construction	2	2	2
Arts	6	4	3
Business	5	3	3
Communication & Media	4	2	1
Computing & Mathematics	5	4	4
Education & Technology	23	17	13
Health & Wellness	8	6	5
Humanities	10	7	6
Interdisciplinary Studies	9	3	1
Law, Justice, & Public Service	16	12	9
Social & Behavioral Sciences	80	62	56
Sustainability	7	2	2
STEM (Science, Technology, Engineering, Math)	59	36	12
	234	160	117

APPENDIX F

PERMISSION TO USE POSITIVE PSYCHOLOGY INTERVENTION

Gmail **Pauline Venieris <pauline.venieris@gmail.com>**

Re: Response to: New GTI Support/Technical Inquiries (goodthinkinc.com)

2 messages

Hannah Costner <hannah@goodthinkinc.com> Wed, Mar 9, 2016 at 1:56 PM
To: pauline.venieris@asu.edu

Hi Pauline,

Thank you so much for reaching out! The KPMG study is still in process, as we're testing it's digital format, so it's not in a peer review journal as of yet, but you can read the habits we used in this article published in the *Harvard Business Review*. We also have this article that you might find helpful on an intensive training session done with Nationwide. If you have any further questions, please do not hesitate to contact me!

Warm regards,
Hannah

GoodThinkInc.

Hannah Glavich | hannah@goodthinkinc.com

On Sun, Mar 6, 2016 at 3:35 PM,

Contact reconversion on form:
New GTI Support/Technical Inquiries

On landing page:
GoodThink | Support/Technical Inquiries

First Name
Pauline

Last Name
Venieris

Company Name
Arizona State University

Job Title
Counseling Psychology PhD Student; Grad/Prof Student Assoc President

Email
pauline.venieris@asu.edu

Phone Number
[redacted]

Notes
I am looking to use the same exercises that Shawn used with KPMG professionals on a group of graduate students at ASU. I would like to ask whether this an original program developed by you or whether it's adapted from somewhere else. I am happy to give credit to you but cannot find any citations. Please email or call me to discuss. I put in a contact request a while back but did not hear from you. I would love to be able to validate this module and give credit where credit is due. I am working on my proposal which is due soon. Thanks in advance!

Pauline Venieris <pauline.venieris@gmail.com> Wed, Mar 9, 2016 at 6:45 PM
To: Hannah Costner <hannah@goodthinkinc.com>

Hannah,

Thanks so much for responding! I appreciate the information and resources you provided. It sounds like I can go ahead and use these as an example and of course, give you all credit!

I am proposing soon and planning to conduct the experiment this summer. I hope to have results by the end of the year and definitely have things all wrapped up by next spring. I will be sure to stay in touch and let you all know about my results - hoping for something significant because I deeply believe in it all! Looking to have various universities, starting with ASU, adopt such protocols for all graduate students in their first year. :)

Thanks again!

--
Pauline Venieris
Doctoral Candidate, Counseling Psychology
GPSA President
Arizona State University

*Sent from my cell phone. Please excuse any typos or curt responses.
[Quoted text hidden]

APPENDIX G

POSITIVE PSYCHOLOGY INTERVENTION PROTOCOL

Instructions:
Everyday for the next 3 weeks, please choose one of the following five activities to complete. After you have finished the daily activity, please complete the accompanying assignment. Please complete each activity at least twice in the three-week period. You will be paid $30 for your complete participation (i.e., taking online surveys and completing daily activities).

Activity 1: 3 Grateful Things
Please write down 3 specific things for which you are grateful today. When you have finished writing, please submit this assignment.

Activity 2: Positive Support Network Message
Please write a positive message to someone in your support network. You do not have actually have to send them this message, just express your positive thoughts and feelings to them here. When you have finished writing, please submit this assignment.

Activity 3: Meditation
Please meditate for two minutes today. You can simply sit in a comfortable position, follow your breath (in and out), and let thoughts come and go without judgment, attachment, or evaluation. Focus on just being in the present moment.

You might choose to use the following audio (http://www.fragrantheart.com/cms/free-audio-meditations/relaxation/2mins-release-stress) or the following video (https://www.youtube.com/watch?v=st9ggrpC4eQ) as guides.

Once you have have meditated for two minutes, please complete the meditation assignment where you will be asked about your meditation practice.

Activity 4: Meaningful Experience
Please explain, in detail, one meaningful experience you had in the last 24 hours. When you have finished writing, please submit this assignment.

Activity 5: Exercise
Exercise for 10 minutes. You can choose whatever form of exercise you prefer. However, you must exercise at one of the four ASU Sun Devil Fitness Complexes (SDFC). To locate the one closet to you, please visit: https://fitness.asu.edu/contact/locations. The fees associated with using the fitness center have been waived for you. Make sure to bring along your ASU ID card and to swipe your card before entering the facility. After completing this activity, please submit the completion form for exercise where you will be asked to record the type of exercise in which you engaged and at which SDFC location.

APPENDIX H

INFORMATIVE STRESS GROUP PROTOCOL

Instructions:
Everyday for the next 3 weeks, please choose one of the following five lessons to complete. Completion means reading the lesson and submitting accompanying assignments. Please complete each activity at least twice in the three-week period. You will be paid $30 for your complete participation (i.e., taking online surveys and completing daily activities).

Five Lessons

Lesson 1: What is Stress

Defining Stress

Stress is the way we react or respond physically, mentally, and/or emotionally to various conditions, changes, and demands of life. The stress we experience is rooted in the "fight or flight" response, during which our bodies undergo physical changes that prepare us to respond to an exciting or dangerous situation. Once the situation has passed or is under control, our stress response subsides, allowing us to relax.

It's normal to have some stress. Stress releases hormones that speed up your heart, make you breathe faster, and give you a burst of energy. Stress can be useful when you need to focus on or finish a big project. But too much stress or being under stress for too long isn't good for you. Constant stress can make you more likely to get sick more often. It can make chronic pain worse and can also lead to long-term health problems such as hear disease, high blood pressure, back problems, and depression.

What happens when you are stressed?

Stress is what you feel when you have to handle more than you are used to. When you are stressed, your body responds as though you are in danger. It makes hormones that speed up your heart, make you breathe faster, and give you a burst of energy. This is called the fight-or-flight stress response.

Some stress is normal and even useful. Stress can help if you need to work hard or react quickly. For example, it can help you win a race or finish an important job on time. But if stress happens too often or lasts too long, it can have bad effects. It can be linked to headaches, an upset stomach, back pain, and trouble sleeping. It can weaken your immune system, making it harder to fight off disease. If you already have a health problem, stress may make it worse. It can make you moody, tense, or depressed. Your relationships may suffer, and you may not do well at work or school.

How do you measure your stress level?

Sometimes it is clear where stress is coming from. You can count on stress during a major life change such as the death of a loved one, getting married, or having a baby. But other times it may not be so clear why you feel stressed.

Assignment:

It's important to figure out what causes stress for you. Everyone feels and responds to stress differently. Tracking your stress may help. Write down something from the past day that made you feel stressed. Discuss how you reacted and what you did to deal with the stress.

Tracking your stress can help you find out what is causing your stress and how much stress you feel. Then you can take steps to reduce the stress or handle it better.

Lesson 2: Stress at ASU

Facts

- 70.1% of ASU students reported experiencing stress within the last school year.
- 30.5% of ASU students reported that stress affected their academic performance.
- 30.0% of ASU students reported that being overcommitted affected their academic performance.
- 21.0% of ASU students reported that being overcommitted had a high or very high effect on their stress levels.

ASU students reported the following items as having a high or very high affect on their stress level within the last school year:

- 36.4% academic responsibilities
- 24.5% career-related issues
- 21.0% being overcommitted
- 18.8% financial concerns
- 17.5% personal emotional issues

American College Health Association. American College Health Association-National College Health Assessment: Arizona State University Spring 2015. Baltimore: American College Health Association; Spring 2015 (n=1,937)

Top Stressors for ASU Students

Stressors are demands from the internal (self) or external (environment) that have the potential to produce stress. Factors or events, either real or imagined, can create a state of stress.

Stressors can generally be divided into two classes:

- Ongoing everyday chronic stressors
- Isolated or major events

Ongoing everyday chronic stressors for college students can be grouped into the following categories:

- School
- Time
- Money
- Relationships

Ongoing everyday chronic stressors for college students can be grouped into the following categories:

- Leaving home
- Balancing changing roles: student, employee, child/parent, significant other

The Good and Bad of Stress

While not all students report that stress affects their academic performance negatively, stress-related behaviors and conditions, such as sleep difficulties, anxiety and depression are cited by ASU students as factors that impede academic performance.

Most students at ASU experience stress-related symptoms such as feeling overwhelmed, feeling exhausted not from physical activity and feeling very sad. Such feelings are common in college life and many students are able to manage their stress and reduce these stress symptoms.
Some students struggle more with stress. These students experience feelings of distress such as feeling so depressed it is difficult to function and seriously considering and/or attempting suicide. These feelings are not common and are an indication that the student is in need of assistance from family, friends, and professional staff.

Stress is not always bad and can be motivating and energizing. Stress about school can motivate students to study to achieve the grades they desire. Being strapped for money can motivate students to work harder to get a promotion or a better paying job. Relationship conflicts or stress in a relationship can motivate students to build communication skills. Having a busy schedule can motivate students to prioritize and clear up their calendar for important activities.

Symptoms of Stress May Include

- Difficulty focusing or concentrating
- Increased anxiety
- Frustration
- Moodiness or change in temperament
- General irritability
- Feeling out of control or overwhelmed

- Restlessness or fatigue
- A change in behavior or routines

Assignment: Describe a recent situation where stress was helpful, motivating, or energizing to you?

Lesson 3: Coping Strategies

https://www.youtube.com/watch?v=hnpQrMqDoqE

Assignment: Which one coping mechanism do you think will be most helpful for you? Describe how and why?

Lesson 4: Managing Stress

What can you do about stress?

Stress is a fact of life for most people. You may not be able to get rid of stress, but the good news is that you can learn ways to manage stress. To get stress under control:

- Find out what is causing stress in your life.
- Look for ways to reduce the amount of stress in your life.
- Learn healthy ways to relieve stress and reduce its harmful effects

Managing Stress

Developing healthy coping skills is important to stress management. You might try some of these ideas:

- Take good care of yourself. Get plenty of rest. Eat well. Don't smoke. Limit how much alcohol and caffeine you drink.
- Try out new ways of thinking. When you find yourself starting to worry, try to stop the thoughts. Or write down your worries and work on letting go of things you cannot change. Learn to say "no."
- Speak up. Not being able to talk about your needs and concerns creates stress and can make negative feelings worse. Assertive communication can help you express how you feel in a thoughtful, tactful way.
- Ask for help. People who have a strong network of family and friends manage stress better.
- Sometimes stress is just too much to handle alone. Talking to a friend or family member may help, but you may also want to see a counselor.

Time management is a powerful stress reducing strategy and a way to find the time for all the things you want and need to do. It helps you decide which things are urgent and which can wait.

Learning how to manage your time, activities, and commitments can be hard. But doing so can make your life easier, less stressful, and more meaningful.

- When you manage your time, you decide which tasks and activities are most important to you. Knowing what's important helps you decide how best to spend your time.
- There are 3 parts to time management: prioritize tasks and activities, control procrastination, and manage commitments.

How can you manage your time? You can start managing your time by: 1) prioritizing tasks, 2) controlling procrastination, and 3) managing your commitments.

1. Prioritize tasks

Make a list of all your tasks and activities for the day or week. Then rate these tasks by how important or urgent they are.

- Urgent tasks are those that must be done right away to avoid a major problem, such as paying the electric bill today because your electricity will be turned off tomorrow. Many people never deal with important things until they become urgent. This approach always leads to stress.
- Important tasks are those that are meaningful or important to you, such as spending time with your family, helping friends, or getting exercise. They are also tasks you must do to avoid a problem, such as paying bills or meeting a deadline at work.
- Not important tasks are ones that don't need to be done or that aren't important to you.

After you have your list and have rated the items, think about how you are spending your time. If you take care of important tasks in a timely way, you won't have as many urgent tasks to worry about. For example, if you pay your bills when you get them, you won't have to juggle your finances and hurry to pay bills the day they are due.

Think about how you can redirect your time to activities that are important and meaningful to you. Are you spending a lot of time on things that aren't important or urgent? Maybe there are things that you don't need to do at all.

2. Control procrastination

The more stressful or unpleasant a task, the more likely you are to put it off. This only increases your stress. You may want to try these tips for controlling procrastination:

- Structure your time. Use a day planner or notebook to plan your day or week. Just seeing on paper that there is a time to get your tasks done can help you get to work. For shorter projects, use a timer or alarm clock to help you stick with your plan.

- Break up large tasks. If you know that you won't be able to focus on a project for 3 hours, break up your work into 1-hour blocks over 3 days. It's easier to face an unpleasant task if the time you are giving it is brief.
- Create short-term deadlines. Short-term deadlines will help you make a habit of meeting deadlines. It will also force you to get things done. That way, when the long-term deadline does arrive, you won't have as much pressure and work built up.
- Avoid perfectionism. If you demand perfection, you might not even start a task because you're worried it won't be perfect. Doing your best is fine. Giving yourself enough time to do your best will reduce stress.

If you find a tip that works for you, stay with it. Over time you'll gain confidence that you can beat the procrastination habit.

You may still slip up sometimes and find yourself putting things off. That's okay. Don't blame yourself. Confidence and positive thinking can help you get back on track.

3. Manage your commitments

Both too many and too few commitments can lead to stress.

Letting go of a commitment doesn't mean giving up. It means learning what's important to you, recognizing that you have limits, and deciding how you want to spend your time. Here are some tips for letting go:

- Don't commit to things that are not important to you.
- When you want or need to let go of something, imagine tying it to a helium balloon, releasing the balloon, and watching it float away.
- Accept that your life is a "work in progress." You don't have to finish every project or meet every goal in your life by tomorrow or even next week. If one of your goals is less important, you can work on it later in your life.

Making commitments can be just as hard as letting them go. People who are under stress tend to have too many commitments instead of too few. But sometimes stress comes from a lack of commitment. If you need more commitment in your life, think about what is most important to you. When you are ready to commit:

- Do it. Give yourself to a new commitment as fully as you can.
- Be responsible. Take your commitment seriously. Don't back out of obligations.
- Open up. Be open to new ideas and suggestions, and be ready to learn.

Assignment: Describe 3 practical changes to your schedule that could help you to reduce stress?

Lesson 5: Taking care of yourself

Self-care can help to prevent stress and reduce existing stress.

When you feel stressed, you can:

- Take slow, deep breaths.
- Soak in a warm bath.
- Listen to soothing music.
- Take a walk or do some other activity.
- Meditate or pray.
- Take a yoga class.
- Have a massage or back rub.
- Have a warm drink that doesn't have alcohol or caffeine.

You also can make some changes in your everyday habits to reduce and relieve stress.

- Get plenty of sleep.
- Stay connected to your family, friends, and other caring people in your life.
- Get regular exercise. It can help you clear your mind and work off feelings of frustration and anxiety.
- Don't drink or eat anything that has caffeine in it. Caffeine can make you feel "wound up" and more stressed.
- Don't smoke or use tobacco. Nicotine can make you feel more anxious.
- Don't drink alcohol. It can cause sleep problems and depression.

Progressive Muscle Relaxation is one relaxation tool. Try it here:
https://www.youtube.com/watch?v=-1nJpxoiPjA

Assignment: What was your experience of the progressive muscle relaxation exercise?

APPENDIX I

PERMISSION TO USE ASU MATERIALS

ASU
ARIZONA STATE UNIVERSITY

May 25, 2016

To Whom It May Concern,

This letter serves as verification that Pauline Venieris has received permission to use the resources related to stress that she gathered from the Arizona State University Health Services (patient portal) website for her dissertation, "The Happiness Project: A Randomized Control Trial of an Online Positive Psychology Intervention for Graduate Students."

Sincerely,

James Rund
Senior Vice President
Educational Outreach and Student Services

Educational Outreach and Student Services
PO Box 876705, Tempe, AZ 85287-6705
(480) 965-2200 Fax: (480) 965-4400

APPENDIX J

WAIT LIST CONTROL GROUP PROTOCOL

Instructions:
Please take the following survey to assess your thoughts and feelings about your personal and academic experience. You will be invited to complete another survey in 3 weeks. You will be paid $30 for your complete participation (i.e., taking online surveys today and again in 3 weeks' time).

APPENDIX K

GRADUATE STRESS INVENTORY-REVISED (GSI-R)

Below is a list of statements describing a variety of issues that may be related to your graduate education.

If one of the events listed below has happened to you and has caused you a great deal of stress, rate that event toward the (—Extremely Stressful) end of the rating scale. If an event has happened to you while you have been in graduate school, but has not bothered you at all, rate that event toward the lower end of the scale (—Not at all Stressful).

If you have never experienced one of the events listed below, please choose number 1.

Not at all stressful			Moderately stressful			Extremely stressful
1	2	3	4	5	6	7

1) Fulfilling responsibilities at home and at school
2) Trying to meet peers of your race/ethnicity on campus
3) Taking exams
4) Being obligated to participate in family functions
5) Arranging childcare
6) Finding support groups sensitive to your needs
7) Fear of failing to meet program expectations
8) Participating in class
9) Meeting with faculty
10) Living in the local community
11) Handling relationships
12) Handling the academic workload
13)Peers treating you unlike the way they treat each other
14) Faculty treating you differently than your peers
15) Writing papers
16) Paying monthly expenses
17) Family having money problems
18) Adjusting to the campus environment
19) Being obligated to repay loans
20) Meeting deadlines for course assignments

APPENDIX L

STEEN HAPPINESS INDEX (SHI)

Please read each group of statements carefully. Then pick one statement in each group that best describes the way that you have been feeling for the past week, including today. Be sure to read all of the statements in each group before making a decision.

Question 1
A. I dislike my daily routine. (1)
B. I neither enjoy nor dislike my daily routine. (2)
C. I enjoy my daily routine, but I do like to get away from it. (3)
D. I enjoy my daily routine so that much that I rarely take breaks from it. (4)
E. I enjoy my daily routine so that much that I almost never take breaks from it (5)

Question 2
A. I feel disconnected from other people. (1)
B. I feel neither connected nor disconnected from other people. (2)
C. I feel connected to my friends and family members. (3)
D. I feel connected with most people, even if I do not know them well. (4)
E. I feel connected to everyone in the world. (5)

Question 3
A. I feel like a failure. (1)
B. I do not feel like a success. (2)
C. I feel like I have succeeded more than the average person. (3)
D. As I look back on my life, all I see are a lot of successes. (4)
E. I feel I am an extraordinary successful person. (5)

Question 4
A. Most of the time I am bored. (1)
B. Most of the time I am neither bored nor interested in what I am doing. (2)
C. Most of the time I am interested in what I am doing. (3)
D. Most of the time I am quite interested in what I am doing. (4)
E. Most of the time I am fascinated by what I am doing. (5)

Question 5
A. I am displeased with myself. (1)
B. I am neither pleased nor displeased with myself – I am neutral (2)
C. I am pleased with myself. (3)
D. I am very pleased with myself. (4)
E. I could not be any more pleased with myself. (5)

Question 6
A. When I am working on a task, I often feel frustrated. (1)
B. When I am working on a task, sometimes I feel frustrated and sometimes I don't. (2)
C. When I am working on a task, I am usually not frustrated. (3)
D. When I am working on a task, I am rarely frustrated. (4)
E. When I am working on a task, I am almost never frustrated. (5)

Question 7
A. I am joyless. (1)
B. I am neither joyful nor joyless. (2)
C. I am more joyful than joyless. (3)
D. I am much more joyful than joyless. (4)
E. Almost everything about my life fills me with joy. (5)

Question 8
A. I dislike my work (paid or unpaid). (1)
B. I neither like nor dislike my work. (2)
C. For the most part, I like my work. (3)
D. My work gives me great satisfaction. (4)
E. My work provides true and deep satisfaction. (5)

Question 9
A. I have made more bad choices than good in my life. (1)
B. Some of the choices I have made in life have been good, some have been bad. (2)
C. I have made more good choices than bad in my life. (3)
D. I have made mostly good choices in my life. (4)
E. Even if I could, I would not change any of the choices I have made. (5)

Question 10
A. Life is bad. (1)
B. Life is okay. (2)
C. Life is good. (3)
D. Life is very good. (4)
E. Life is wonderful. (5)

Question 11
A. My life does not have a purpose. (1)
B. I do not know my purpose in life. (2)
C. I have a hint about my purpose in life. (3)
D. I have a pretty good idea about my purpose in life. (4)
E. I have a very clear idea about my purpose in life. (5)

Question 12
A. I have little or no energy. (1)
B. My energy level is neither high nor low. (2)
C. I have a good amount of energy. (3)
D. I feel energetic doing almost everything. (4)
E. I have so much energy that I feel I can do almost anything. (5)

Question 13
A. I experience more displeasure than pleasure. (1)
B. I experience pleasure and displeasure in equal measure. (2)

C. I experience more pleasure than displeasure. (3)
D. I experience much more pleasure than displeasure. (4)
E. My life is filled with pleasure. (5)

Question 14
A. Time passes slowly during most or all of my activities. (1)
B. Time passes quickly during some of my activities and slowly for others. (2)
C. Time passes quickly during most of my activities. (3)
D. Time passes quickly during all of my activities. (4)
E. Time passes so quickly during all of y activities that I do not even notice it. (5)

Question 15
A. I am ashamed of who I am. (1)
B. I am not ashamed of who I am. (2)
C. I am proud of who I am. (3)
D. I am very proud of who I am. (4)
E. I am extraordinarily proud of who I am. (5)

Question 16
A. I am discouraged by the future. (1)
B. I am neither encouraged nor discouraged about the future. (2)
C. I feel somewhat encouraged about the future. (3)
D. I feel quite encouraged about the future. (4)
E. I feel extraordinarily encouraged about the future. (5)

Question 17
A. When I am working on a task, I pay more attention to what is going on around me than I do to the task. (1)
B. When I am working on a task, I pay as much attention to what is going on around me as I do to the task. (2)
C. When I am working on a task, I pay more attention to the task that to what is going on around me. (3)
D. When I am working on a task, I rarely notice what is going on around me. (4)
E. When I am working on a task, I pay so much attention to it that the outside practically ceases to exist. (5)

Question 18
A. Every day I spend almost all of my time doing things that are unimportant. (1)
B. Every day I spend a lot of time doing things that are neither important nor unimportant. (2)
C. Every day I spend some time doing things that are important. (3)
D. I spend the greater part of each day doing things that are important. (4)
E. Practically every moment of the day is spent doing things that are important. (5)

Question 19
A. I am pessimistic. (1)
B. I am neither optimistic nor pessimistic. (2)
C. I am optimistic. (3)
D. I am very optimistic. (4)
E. I am the most optimistic person I know. (5)

Question 20
A. If anything, what I do has a negative effect on the world. (1)
B. In the grand scheme of things, my existence neither helps nor hurts the world. (2)
C. I am making a small but positive difference in the world. (3)
D. I am making the world a better place. (4)
E. My life is having a lasting, positive impact on the world. (5)

APPENDIX M

RESILIENCE SCALE FOR ADULTS (RSA)

Please think of how you usually are, or how you have been in the last month, how you think and feel about yourself and important people surrounding you. Please choose the number that is closest to the end statement that describes you best.

1. My plans for the future are

1	2	3	4	5
Difficult to to accomplish				Possible to accomplish

2. When something unforeseen happens

1	2	3	4	5
I always find a solution				I often feel bewildered

3. My family's understanding of what is important in life is

1	2	3	4	5
Quite different than mine				Very similar to mine

4. I feel that my future looks

1	2	3	4	5
Very promising				Uncertain

5. My future goals

1	2	3	4	5
I know how to accomplish				I am unsure how to accomplish

6. I can discuss personal issues with

1	2	3	4	5
No one				Some friends/ family members

7. I feel

1	2	3	4	5
Very happy with my family				Very unhappy with my family

8. I enjoy being

1	2	3	4	5
Together with people				By myself

9. Those who are good at encouraging me are

1	2	3	4	5
Some close friends/family members				No one

10. The bonds among my friends are

1	2	3	4	5
Weak				Strong

11. My personal problems

1	2	3	4	5
Are unsolvable				I know how to solve

12. When a family member experiences a crisis/ emergency

1	2	3	4	5
I am informed right away				It takes quite a while before I am told

13. My family is characterized by

1	2	3	4	5
Disconnection				Healthy coherence

14. To be flexible in social settings

1	2	3	4	5
Is not important to me				Is really important to me

15. I get support from

1	2	3	4	5
Friends/ family members				No one

16. In difficult periods my family

1	2	3	4	5
Keeps a positive outlook on the future				Views the future as gloomy

17. My abilities

1	2	3	4	5
I strongly believe in				I am uncertain about

18. My judgments and decisions

1	2	3	4	5
I often doubt				I trust completely

19. New friendships are something

1	2	3	4	5
I make easily				I have difficulty making

20. When needed I have

1	2	3	4	5
No one who can help me				Always someone who can help me

21. I am at my best, when I

1	2	3	4	5
Have a clear goal to strive for				Can take one day at a time

22. Meeting new people is

1	2	3	4	5
Difficult for me				Something I am good at

23. When I am with others

1	2	3	4	5
I easily laugh				I seldom laugh

24. When I start on new things/projects

1	2	3	4	5
I rarely plan ahead; I just get on with it				I prefer to have a thorough plan

25. Facing other people, our family acts

1	2	3	4	5
Unsupportive of one another				Loyal towards one another

26. For me thinking of good topics for conversation is

1	2	3	4	5
Difficult				Easy

27. My close friends/family members

1	2	3	4	5
Appreciate my qualities				Dislike my qualities

28. I am good at

1	2	3	4	5
Organizing my time				Wasting my time

29. In my family we like to

1	2	3	4	5
Do things on our own				Do things together

30. Rules and regular routines

1	2	3	4	5
Are absent in my everyday life				Simplify my everyday life

31. In difficult periods I have a tendency to

1	2	3	4	5
View everything as gloomy				Find something good that helps me thrive

32. My goals for the future are

1	2	3	4	5
Unclear				Well thought through

33. Events in my life that I cannot influence

1	2	3	4	5
I manage to come to terms with				Are a constant source of worry/ concern

APPENDIX N

DEMOGRAPHIC QUESTIONNAIRE

1. Please fill in your 9-digit student identification number: _____

2. Please fill in your ASUrite (e.g., sdevil): _____

3. Please fill in your ASU email address: _____

4. Please fill in the ASU location with which you identify: _____
    a. Tempe
    b. Downtown Phoenix
    c. West
    d. Polytechnic
    e. Thunderbird
    f. Online

5. Were you a graduate student in the spring 2016 semester?
    a. Yes
    b. No

6. Will you be continuing as a graduate student in the fall 2016 semester?
    a. Yes
    b. No

7. Did you just graduate or will you be graduating in August?
    a. Yes
    b. No

8. Are you an international student?
    a. Yes
    b. No

9. Please fill in your chronological age: _____

10. Please select the gender with which you identify:
    a. Male
    b. Female
    c. Transgender
    d. Other, specify: _____

11. Please select the race with which you identify:
    a. African American
    b. Asian American
    c. Caucasian/White
    d. Latino/a/Hispanic
    e. Native American
    f. Biracial/Multiracial

g. Other, specify: _____

12. Please choose your graduate level of study:
    a. Masters
    b. Doctoral
    c. Other, specify: _____

13. Please fill in your major or specific program of study (e.g., Business, Communications, Engineering, Law, etc.): _____

14. Please choose the broad discipline in which your specific program of study falls. You may use this website to determine which interest area your program of study is categorized (https://webapp4.asu.edu/programs/t5/graduate/false):
    a. Architecture and Construction
    b. Arts
    c. Business
    d. Communication and Media
    e. Computing and Mathematics
    f. Education and Teaching
    g. Health and Wellness
    h. Humanities
    i. Interdisciplinary Studies
    j. Law, Justice, and Public Service
    k. Social and Behavioral Sciences
    l. Sustainability
    m. STEM (Science, Technology, Engineering, Math)

15. Please identify the year of schooling you just finished in the 2015-2016 academic year:
    a. 1st
    b. 2nd
    c. 3rd
    d. 4th
    e. 5th
    f. 6th or higher

APPENDIX O

FOLLOW-UP QUESTIONS

Before the study began (before June 1st, 2016), did you engage in any of the following activities on a consistent basis (i.e. at least once weekly, if not more):

□ Mindfulness/meditation practice

□ Regular physical exercise

□ Keeping a gratitude or other journal

□ Psychotherapy/Counseling

□ Specific relaxation exercises (e.g., progressive muscle relaxation)

Since the study has ended, have you engaged in any of the following activities on a consistent basis (i.e., at least once weekly, if not more):

□ Mindfulness/meditation practice

□ Regular physical exercise

□ Keeping a gratitude or other journal

□ Psychotherapy/Counseling

□ Specific relaxation exercises (e.g., progressive muscle relaxation)

Since the study ended (June 26th, 2016), have you incorporated any of the activities you learned from the protocol into your life on a consistent basis (i.e., at least once weekly if not more):

□ Yes

□ No

APPENDIX P

PRE-ANALYSES

Table 1

Results of the ANOVA tests for each covariate at Time 1 between the three treatment groups

		Sum of Squares	df	Mean Square	F	Sig.
GSIR pretotal	Between Groups	69.472	2	34.736	.104	.902
	Within Groups	77455.643	231	335.306		
	Total	77525.115	233			
SHI pretotal	Between Groups	188.864	2	94.432	.662	.517
	Within Groups	32951.175	231	142.646		
	Total	33140.038	233			
RSA pretotal	Between Groups	1709.195	2	854.597	2.146	.119
	Within Groups	91990.651	231	398.228		
	Total	93699.846	233			
GSIR preenv	Between Groups	71.078	2	35.539	.452	.637
	Within Groups	18174.460	231	78.677		
	Total	18245.538	233			
GSIR preaca	Between Groups	3.628	2	1.814	.029	.972
	Within Groups	14498.987	231	62.766		
	Total	14502.615	233			
GSIR prefam	Between Groups	64.400	2	32.200	.825	.440
	Within Groups	9019.638	231	39.046		
	Total	9084.038	233			
Age	Between Groups	93.794	2	46.897	1.207	.301
	Within Groups	8857.764	228	38.850		
	Total	8951.558	230			
Sex	Between Groups	.054	2	.027	.094	.911
	Within Groups	66.339	231	.287		

	Total	66.393	233			
Ethnicity	Between Groups	10.204	2	5.102	1.524	.220
	Within Groups	773.561	231	3.349		
	Total	783.765	233			
Grad level	Between Groups	1.005	2	.503	1.775	.172
	Within Groups	65.388	231	.283		
	Total	66.393	233			
Year	Between Groups	.485	2	.243	.088	.916
	Within Groups	637.177	231	2.758		
	Total	637.662	233			

Table 2

Correlations between dependent variables/outcome measures

	SHI pretest	RSATotal pretest
GSIR Total pretest	.30**	-.21**
SHI pretest	-	.51***
	SHI pretest	RSA posttest
GSIR posttest	-.23**	-.21**
SHI posttest	-	.55**
	SHI follow-up	RSA follow-up
GSIR follow-up	-.39***	-.30***
SHI follow-up	-	.46***

indicates $p < .01$, * indicates $p < .001$

Table 3

Covariate correlations

		Age	Sex	Ethn	Gradlevel	Discipline	Year
Age	Pearson Correlation	1	.108	-.167**	.166*	-.212**	.284**
	Sig. (2-tailed)		.097	.010	.010	.001	.000
	N	238	238	238	238	238	238
Sex	Pearson Correlation	.108	1	-.286**	.164*	-.163*	-.033
	Sig. (2-tailed)	.097		.000	.010	.011	.606
	N	238	242	242	242	242	242
Ethn	Pearson Correlation	-.167**	-.286**	1	-.098	.201**	-.076
	Sig. (2-tailed)	.010	.000		.130	.002	.240
	N	238	242	242	242	242	242
Gradlevel	Pearson Correlation	.166*	.164*	-.098	1	-.064	.241**
	Sig. (2-tailed)	.010	.010	.130		.322	.000
	N	238	242	242	242	242	242
Discipline	Pearson Correlation	-.212**	-.163*	.201**	-.064	1	.114
	Sig. (2-tailed)	.001	.011	.002	.322		.077
	N	238	242	242	242	242	242
Year	Pearson Correlation	.284**	-.033	-.076	.241**	.114	1
	Sig. (2-tailed)	.000	.606	.240	.000	.077	
	N	238	242	242	242	242	242

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Table 4

Skewness and kurtosis values for each covariate and dependent value used

	Skewness	Kurtosis
GSIR Total T1	-.02	.18
SHI TI	-.18	.13
RSA Total T1	-.81	1.56
GSIR Total T2	-.03	-.32
SHI T2	-.32	-.02
RSA Total T1	-.39	-.38
GSIR Total T3	.07	-.52
SHI T3	-.22	-.01
RSA Total T3	.86	1.74

APPENDIX Q

ANALYSES

Table 1

Test results

		Post-test	Follow-up
GSIR Total	Effect of Treatment	$F(2, 151)=1.08$	$F(2, 106)=0.19$
	PPI vs Stress	$B = 4.03$	$B = 0.64$
	PPI vs Control	$B = 0.16$	$B = 1.98$
	Stress vs Control	$B = 3.87$	$B = -1.34$
GSIR Academic	Effect of Treatment	$F(2, 151)=2.27$	$F(2, 106)=0.05$
	PPI vs Stress	$B = 1.31$	$B = 0.47$
	PPI vs Control	$B = -1.25$	$B = 0.31$
	Stress vs Control	$B = 2.09$	$B = 0.16$
GSIR Environment	Effect of Treatment	$F(2, 222)=8.10$***	$F(2, 106)=0.29$
	PPI vs Stress	$B = -2.12$	$B = 0.11$
	PPI vs Control	$B = 5.02$**	$B = 1.04$
	Stress vs Control	$B = -7.15$***	$B = -0.92$
GSIR Family	Effect of Treatment	$F(2, 151)=0.18$	$F(2, 106)=0.54$
	PPI vs Stress	$B = 0.58$	$B = 0.43$
	PPI vs Control	$B = .39$	$B = 1.13$
	Stress vs Control	$B = 0.19$	$B = -0.70$
SHI	Effect of Treatment	$F(2, 151)=1.59$	$F(2, 106)=1.40$
	PPI vs Stress	$B = 0.29$	$B = -3.12$
	PPI vs Control	$B = -2.19$	$B = -3.41$
	Stress vs Control	$B = 2.48$	$B = 0.29$
RSA Total	Effect of Treatment	$F(2, 151)=4.74$**	$F(2, 106) = 1.22$
	PPI vs Stress	$B = -3.82$	$B = -1.89$
	PPI vs Control	$B = -6.30$***	$B = -3.92$
	Stress vs Control	$B = 2.48$	$B = 2.03$
RSA Self Resilience	Effect of Treatment	$F(2, 151) = 2.29$	$F(2, 106) = 0.52$
	PPI vs Stress	$B = -0.27$	$B = 0.14$,
	PPI vs Control	$B = -1.14$*	$B = -0.52$
	Stress vs Control	$B = 1.14$	$B = 0.66$
RSA Future Planning	Effect of Treatment	$F(2, 151) = 2.66$+	$F(2, 106) = 3.55$*
	PPI vs Stress	$B = -0.85$*	$B = -1.06$*
	PPI vs Control	$B = -0.69$+	$B = -0.02$
	Stress vs Control	$B = -0.17$	$B = -1.04$*
RSA Social Competence	Effect of Treatment	$F(2, 151) = 1.93$	$F(2, 106) = 1.43$
	PPI vs Stress	$B = -0.78$	$B = -1.02$
	PPI vs Control	$B = -1.04$+	$B = -0.94$

	Stress vs Control	*B* = 0.27	*B* = -0.08
RSA Family Cohesion	Effect of Treatment	*F*(2, 151) = 6.07**	*F*(2, 106) = 1.41
	PPI vs Stress	*B* = -0.90	*B* = -0.25
	PPI vs Control	*B* = -1.89***	*B* = -1.13
	Stress vs Control	*B* = 0.99+	*B* = 0.89
RSA Social Resources	Effect of Treatment	*F*(2, 151) = 0.63	*F*(2, 106) = 1.00
	PPI vs Stress	*B* = -0.14	*B* = -0.04
	PPI vs Control	*B* = -0.61	*B* = -0.96
	Stress vs Control	*B* = 0.24	*B* = 0.92
RSA Structured Style	Effect of Treatment	*F*(2, 151) = 2.20	*F*(2, 106) = 0.66
	PPI vs Stress	*B* = -0.90+	*B* = 0.07
	PPI vs Control	*B* = -0.59	*B* = -0.40
	Stress vs Control	*B* = -0.31	*B* = 0.47

Note: + indicates p <.10, * indicates p <.05, **indicates p < .01, *** indicates p <.001

Table 2

Means and standard deviations of dependent variables by treatment group

	PPI Group	Informative Stress	Control Group
GSIR Total Pre-test	70.63(20.21)	71.47(19.62)	70.15(14.59)
GSIR Academic	22.60(10.06)	22.38(9.22)	21.33(7.07)
GSIR Environment	31.39(8.41)	31.29(8.11)	31.09(7.20)
GSIR Family	16.65(6.19)	17.80(6.54)	17.73(5.99)
SHI Total	58.58(13.77)	58.68(11.19)	60.54(10.67)
RSA Total	118.96(22.32)	122.32(18.88)	125.60(18.48)
RSA Self	21.38(4.80)	21.53(4.51)	22.04(4.68)
RSA Planned Future	14.44(3.25)	15.42(2.60)	15.05(2.95)
RSA Social Competence	21.96(4.45)	22.82(3.93)	23.32(3.98)
RSA Family Cohesion	21.29(4.46)	21.89(4.43)	23.17(4.10)
RSA Social Resources	25.51(4.91)	25.51(4.40)	26.54(4.09)
RSA Structured Style	14.57(3.37)	15.15(2.90)	15.49(2.57)

GSIR Total Post-test	69.20 (23.02)	71.88(17.00)	67.15 (17.24)
GSIR Academic	31.12(9.87)	31.83(7.24)	28.75(7.68)
GSIR Environment	15.66(12.05)	13.11(11.14)	19.62(8.88)
GSIR Family	16.16(6.45)	17.73(6.27)	17.13(6.06)
SHI Total	62.43 (15.94)	61.23 (14.23)	61.42 (13.12)
RSA Total	123.59 (20.55)	122.33(20.93)	121.17(21.56)
RSA Self	21.92(4.31)	21.68(4.12)	21.03(4.97)
RSA Future Planning	14.88(3.00)	14.70(3.12)	14.55(2.83)
RSA Social Competence	22.82(4.31)	22.98(3.43)	22.55(4.56)
RSA Family Cohesion	22.80(4.53)	21.90(4.93)	22.00(4.36)
RSA Social Resources	26.06(4.96)	26.18(5.38)	26.03(5.04)
RSA Structured Style	15.10(3.26)	14.90(2.76)	15.13(2.80)
GSIR Total Follow-Up	71.00(23.97)	70.09(16.36)	71.98(17.27)
GSIR Academic	32.33(9.01)	32.30(7.78)	32.27(6.66)
GSIR Environment	23.43(11.55)	21.00(7.33)	21.96(9.33)
GSIR Family	15.35(6.51)	16.79(5.90)	17.76(5.86)
SHI Total	63.92 (13.09)	58.59 (13.71)	62.00 (13.50)
RSA Total	122.57(21.05)	120.85(20.02)	121.07(20.13)
RSA Self	21.51(4.83)	21.03(4.25)	20.96(4.70)
RSA Planned Future	14.73(3.20)	14.12(2.79)	15.00(3.07)
RSA Social Competence	23.24(4.62)	23.12(3.97)	23.07(4.25)
RSA Family Cohesion	22.32(4.45)	21.55(4.79)	21.78(4.47)
RSA Social Resources	26.16(5.01)	26.00(4.84)	25.47(4.90)
RSA Structured Style	14.60(2.57)	15.03(2.77)	14.80(2.60)

Table 3
Scale descriptives

	Wave 1	(Pre-test)			Wave 2	(Post-test)			Wave 3	(Follow-up)		
	M	*SD*	Range	Alpha	*M*	*SD*	Range	Alpha	*M*	*SD*	Range	Alpha
GSIR-total	71.48	(17.63)	(34;124)	.85	69.15	(19.24)	(20;117)	.89	71.25	19.68	(29;118)	.89
GSIR-acad	31.91	7.49	(14;49)	.79	30.37	8.41	(7;48)	.85	31.99	8.06	(12;49)	.83
GSIR-fam	16.93	6.36	(5;35)	.61	17.21	6.20	(6;35)	.69	16.77	6.23	(5;35)	.63
GSIR-environ	22.34	8.72	(8;50)	.80	21.92	8.44	(8;47)	.83	22.49	9.61	(8;47)	.84
SHI	60.18	(11.77)	(27;91)	.92	61.14	(14.16)	(20;96)	.95	61.09	13.57	(26;93)	.95
RSA-total	123.15	(19.57)	(62;161)	.91	122.16	(20.92)	(70;164)	.93	121.16	21.24	(35;158)	
RSA-PS	21.57	(4.72)	(8;30)	.68	21.50	(4.48)	(7;30)	.72	16.34	8.79	(1;30)	.73
RSA-PF	14.96	(2.99)	(4;20)	.59	14.78	(2.92)	(6;20)	.67	14.69	3.05	(4;20)	.64
RSA-SC	22.63	(4.24)	(3;30)	.56	22.74	(4.16)	(12;30)	.65	22.93	4.39	(8;30)	.67
RSA-FC	21.95	(4.51)	(7;30)	.66	22.25	(4.49)	(6;30)	.72	21.84	4.62	(6;30)	.72
RSA-SR	25.62	(4.75)	(9;35)	.67	25.88	(5.02)	(11;35)	.79	25.64	5.10	(5;33)	.75
RSA-SS	14.96	(3.08)	(3;20)	.45	15.01	(2.93)	(6;20)	.56	14.71	2.91	(5;20)	.45

Table 4

Frequency breakdown of follow-up questions

	Before Study	Engaged in			Incorporated		
	Frequency	PPI	Stress	Control	PPI	Stress	Control
Mindfulness	22	8	5	3	10	5	2
Physical Exercise	86	23	26	31	9	9	14
Gratitude Journal	22	6	4	4	6	2	2
Psychotherapy	14	3	2	5	0	0	2
Relaxation	8	3	3	3	1	3	2

Table 5

Means and standard deviations by program type at follow-up

	PPI		Informative Stress		Control	
	Psych-based (n=13)	Non-psych-based (n=38)	Psych-based (n=12)	Non-psych-based (n=28)	Psych-based (n=21)	Non-psych-based (n=48)
GSIR Total Post-test	60.54; 23.17	72.16; 22.53	72.50; 17.79	71.61; 16.97	69.14; 19.08	66.27; 16.50
SHI	62.92; 9.69	60.92;17.66	61.75; 16.64	59.57; 13.35	56.19; 14.67	62.27; 12.09
RSA Total	127.77; 15.54	122.16; 22.00	123.00; 23.80	122.04; 20.05	111.57; 23.29	125.38; 19.55
	n=10	n=27	n=9	n=24	n=16	n=29
GSIR Total Follow-Up	66.70; 31.77	72.59;20.86	68.11; 15.94	70.83; 16.80	74.75; 18.37	70.45; 16.77
SHI	66.00; 9.27	63.15;14.33	57.78; 16.87	58.88; 12.73	58.44; 16.40	63.97; 11.45
RSA Total	124.70; 14.22	121.78;23.26	122.11; 26.50	120.38; 17.68	113.13; 21.56	125.45; 18.21