Using a Self-Paced Web-Based Intervention to Promote Psychological Flexibility in University Students

A Dissertation Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Danielle Marie Shine

August 2025

Acknowledgements

I extend my heartfelt gratitude to my supervisor, Dr. Merilee McCurdy, and dissertation committee members, for their unwavering support, guidance, and valuable insights throughout this journey. Their expertise and encouragement have been pivotal in shaping my research. I also want to thank my family, who have been a constant source of support and motivation. To my parents, your unwavering belief in me made this achievement possible. Additionally, I appreciate the support from my extended family, friends, and colleagues. Their encouragement during long semesters and celebratory moments kept me going. Lastly, I acknowledge the participants who generously contributed to my research. Their willingness to participate in this study enriched my work and reinforced my commitment to advancing the field of mental health. In closing, this dissertation would not have been possible without the collective efforts of these remarkable individuals. Thank you all.

Abstract

In the current study, we collected data from undergraduate students who completed a web based, self-paced mental health intervention. The purpose of this study was to evaluate a web-based program and provide services to students who may experience barriers to accessing mental health services. We recruited students from several undergraduate courses attending a large public university in the Southeast United States. The intervention is based on principles from Acceptance and Commitment Therapy. Outcomes measured included acceptance, mindfulness, values, stress, cognitive flexibility, and well-being. We did not find significant changes in outcomes for the intervention group, while waitlist group experiences a significant decrease in cognitive flexibility. If given a larger sample, significant changes may have been observed in mindfulness within the experimental group. Regarding implications, student counseling centers and others working with students with presenting mental health concerns may benefit from a web-based program targeted at increasing psychological flexibility. Future researchers may consider increasing user engagement and human interaction efforts, such as identifying strategies to enhance participation over time and investigating the role of human support (e.g., therapist guidance, peer support) alongside this web-based intervention.

Table of Contents

Chapter I: Literature Review 1

Functional impact of mental health 4

Need for college mental health services 9

Acceptance and commitment therapy (ACT) 12

ACT and the hexaflex model 15

Treatment targets for ACT 19

Review of web-based interventions 23

Statement of the problem 29

Chapter II: Methods 32

Participants and setting 32

Materials 32

Instruments/dependent variables 33

Independent variable 37

Procedure 40

Data analyses 43

Chapter III: Results 44

Research question one 45

Research question two 45

Research question three 47

Research question four 47

Research question five 47

Chapter IV: Discussion 51
Differences in stress and well-being 51
Differences in psychological flexibility 52
Stress differences on impact of program 54
Well-being differences on attrition rates 55
Perceptions of program effectiveness 56
Limitations and future research 57
Implications 65
Conclusion 66
References 67
Appendices 75
Vita 87

LIST OF TABLES

Table 1. Demographics collected.....77

Table 2. Intervention (Mindful ACTion).....78

Table 3. Comparison of web-based intervention module content.....79

Table 4. Comparison of web-based intervention module elements.....80

Table 5. Intervention access questions.....81

Table 6. The acceptability questionnaire.....82

Table 7. Demographic characteristics at baseline.....83

Table 8. Means and standard errors of scales measuring stress and well-being.....84

Table 9. Means and standard errors of scales measuring psychological flexibility.....84

LIST OF FIGURES

Figure 1. Flow diagram of participants.....85

Chapter I

Literature Review

The National Institute of Mental Health (NIMH) reported that nearly one in five individuals living in the United States (U.S.) over the age of 18 experience mental illness (NIMH, 2023). Prevalence rates differ among two categories, any mental illness and serious mental illness, and between groups based on sex, age, and race/ethnicity. In 2021, about 22% of the U.S. population experienced any mental illness (AMI), which is categorized as little to severe impairment with no impact on one's ability to complete daily life activities. This percentage was higher among those identifying as females than those identifying as males (27.2% compared to 18.1%) and among those identifying as two or more races (34.9%), followed by American Indian/Alaskan Native (AI/AN; 26.6%). Additionally, the rate was higher among those aged 18-25 years (33.7%) when compared to those aged 26-49 years (28.1%) and those aged 50 years and older (15.0%). In 2021, individuals with a serious mental illness (SMI), categorized as serious impairment in and substantial interference with one's ability to complete daily life activities, represented 5.5% of U.S. adults. Females represented 7.0% of those identifying with a SMI compared to males representing 4.0%. Adults in the 18-25 age group had the highest prevalence for a SMI representing 11.4% compared to adults 26-49 (7.1%) and adults 50 or older (2.5%). AI/AN individuals had the highest rate of SMIs, with 9.3%, compared to those identifying as two or more races with 8.2%. Mental health needs are most prevalent among college-age adults.

Within the past year, 47.2% of individuals experiencing AMI sought mental health services (inpatient or outpatient treatment/counseling, or prescribed medicines for symptoms related to mental health disorders; NIMH, 2023). Females sought more than males (51.7% compared to 40.0%). The percentage varied between age groups of those who sought treatment;

however, prevalence ranged from 44.6% (18-25 age group) to 48.1% (26-49 age group). Nearly 66% of individuals with an SMI reported receiving treatment in the past year. This rate was higher among females, and those in the age groups of 26 and older, compared to males and adults aged 18-25 respectively. Evidence suggests only half of individuals in need of mental health services sought treatment.

According to the most recent data provided by the Household Pulse Survey (American College Health Association, 2022), which used a four-item measure including scale items from the Patient Health Questionnaire (PHQ) and the Generalized Anxiety Disorder 2 (GAD-2), 32.4% of respondents met criteria for symptoms related to an anxiety or depressive disorder. Rates of symptoms were higher for adults who were identified as the following: young adults aged 18-29, female, transgender, bisexual, gay or lesbian, Hispanic or Latinx, and two or more races. Education played a role in individuals who indicated higher symptoms of mental illness. Those who have a bachelor's degree or higher experienced negative health symptoms less than peers who completed some college, a high school diploma, or some high school.

Among adolescents aged 13-18, nearly 50% are estimated to have and experience symptoms related to a mental illness (NIMH, 2023). Of this 50%, about 22% were estimated to experience severe impairment based on the Diagnostic Statistical Manual, fourth edition. Between males and females, females experienced higher rates of impairment (51.0% to 48.1%). As individuals age, the percentage of people experiencing the impact of a mental illness increases steadily, with the largest increase between adolescents aged 15-16 (49.3%) to those aged 17-18 (56.7%). Adolescents experiencing symptoms of mental health who do not receive treatment or identification are at higher risk for lower education attainment, difficulty with employment, and personal care (Souza Pinto et al., 2014).

In the past decade, the rate of those experiencing symptoms of anxiety, depression, and other negative mental events that impact daily functioning has increased. Symptoms of anxiety include feeling tense, restless, or nervous; feelings of worry; inability to relax; difficulty controlling feelings of worry; and physical symptoms such as sweating, trembling, difficulty sleeping (Strohle et al., 2018). Symptoms of depression include lack of motivation, loss of interest or pleasure, and an inability to see an end to those feelings (Kanter et al., 2008). Other disorders like autism spectrum disorder, attention-deficit hyperactivity disorder, and post-traumatic stress disorder resemble difficulties of those who experience anxiety and depression, as well as those who have difficulty with emotional regulation, executive function, and social appropriateness (Biederman et al., 2014; Javed et al., 2021; Stavropoulos et al., 2018). Several reasons for an increased prevalence rate of individuals experiencing mental health issues include increased societal pressure on academic achievement, isolation (e.g., from others, feeling left out, lacking companionship), harassment and discrimination, and grief and loss (Radfar et al., 2021; Winkler et al., 2020). Additionally, other stressors may relate to social media, work, finances, and housing (American College Health Association, 2022). Increased identification and a decreasing trend of stigma surrounding mental health are also key contributors and tend to be a positive reason for increased prevalence rates.

Many people experience symptoms caused by various environmental or genetic disorders. Historically, mental health has been stigmatized; individuals lacked information and resources to identify mental and physical manifestations of disorders, as well as resources available to help (Javed et al., 2021; Parcesepe & Cabassa, 2013). Over the years, individuals have become more willing and open to the idea of seeking help to manage their symptoms through the form of counseling, medicine, and interventions. Many young people, or people who

range in age from adolescents to millennials, grew up in a time where symptoms of anxiety, depression, and others were somewhat typical or more common than for parents of these generations. Social media and the internet provided easily accessible information about the nature of various disorders. Websites like Mayo Clinic, WebMD, and NIH provide various web pages about the nature and causes of disorders, symptoms, and treatments offered. Millennials and younger people can navigate web pages and online platforms with ease when seeking resources to navigate a mental health disorder or symptoms of said mental health disorders.

Functional Impact of Mental Health

Mental health disorders can impact a variety of areas of one's daily life. One can experience an impact on social, emotional, and adaptive functioning across many settings (Pascoe et al., 2020). These impairments across areas are interrelated, influencing other areas and exacerbating impairment. *Social impairment* often includes difficulty interacting with others of the same age in a developmentally typical way, communicating or leading others, making suggestions for improvement, and getting along well with others. *Emotional impairment* typically influences the social aspect of one's life. It includes an inability to regulate emotions, both negative and positive, an inability to bounce back quickly from an aversive event, and an inability to maintain a high frustration tolerance. *Adaptive impairment* can impact executive functioning skills, which are crucial for student success in college. For instance, those with impairment in adaptive skills often have trouble taking care of themselves or their environment, communicating functionally to get needs met, seeking out and finding necessary information for a task, transitioning from one space or activity to another, and addressing the needs of tasks in an appropriate and efficient way.

Each group of individuals, or generation of individuals, experiences the impacts of disorders differently based on their current life stage (Javed et al., 2021; Parcesepe & Cabassa, 2013; Winkler, 2020). For instance, a child enrolled in a school system will experience the impacts of their disability on their grades and academic success. Additionally, they may experience a social impact. Much of a school experience involves connecting and interacting with peers socially, whether it is during group activities, extracurriculars, or a matter of fitting in. Individuals impacted by an anxiety disorder may have difficulty setting aside feelings of worry and acting irrationally, while others may need excessive reassurance from teachers or peers that they are completing work appropriately (Campbell et al., 2022; Pascoe et al., 2020). Students also may have difficulty moving from one activity to the next if they are anxious about transitions, leaving the classroom, or partaking in group activities. Those struggling with a depressive disorder may have difficulty engaging with others or may present in an overly negative way, unfamiliar and uninviting to peers. Symptoms related to these disorders may look like inattention in a classroom due to the perseveration of anxious or depressive thoughts.

The experience of a child enrolled in school and impacted by a mental disorder differs greatly from an adult, living and working independently. An adult with full or part-time employment struggling to maintain a healthy mental space may experience many functional and employment related impacts. For instance, one who is struggling with social anxiety may have difficulty completing all facets of their job if part of it includes public speaking. Ultimately, the level of impact differs depending on the stage of life, type of disorder, and severity.

Impact on Younger Students. Academic performance often is impacted when one is experiencing symptoms of psychopathology, especially for younger individuals. Common areas impacted in a school system include task completion (e.g., homework assignments, classwork),

following along with class procedures (e.g., lecture, class notes, classwork), and study skills. K-12 students whose academic performance is lacking often are referred to a support team who create a tailored individualized education plan (IEP). The IEP offers many accommodations and modifications to make education more accessible for students who need it. Some accommodations offered for students meeting eligibility criteria for anxiety include, but are not limited to, access to breaks when symptoms arise, extra time and warnings before transitions, clearly stated written instructions and expectations, preferential seating (near the teacher or the class door), frequent check-ins, and extra time for tests and homework. Accommodations for students receiving services for depression include preferential seating, additional time for tests and assignments, reduced course load, flexible attendance, and counseling services. Based on the student's need and area of impact, various supports can be provided to ease the burden of symptoms and make education accessible.

While accommodations exist for students with mental health disorders, the U.S. is suffering a shortage of mental health professionals in all settings. Because of this, not every student is identified or has an IEP in place. Students are often underdiagnosed and underserved. Additionally, little is known about the impact of classwide or schoolwide systems for identification and support for K-12 students with mental health disorders.

Impact on College Students. The higher education setting has students, some previously diagnosed and some without a diagnosis, who experience mental health symptoms that has the potential to hinder their success. Individuals who were not identified in the K-12 setting as needing support due to a mental health issue may not be familiar with supports available to them in an education setting. This group of students gains independence and begins college without access to many supports and without their support system, often in other states. College

counseling centers also are understaffed and finding support that is consistent, meets the needs of the student, and is appropriate can be difficult (Flannery, 2023).

College students experience a variety of problems entering university as a result of stress, such as poor sleep, isolation, discrimination, poor physical health, higher risk for substance use, and impaired mental health (Campbell et al., 2022; Lattie et al., 2019; Pascoe et al., 2020). These problems are exacerbated when students experience psychopathology or symptoms of various psychopathologies. Many problems arise, one being the impact of negative well-being on academic outcomes, motivation, and dropout rates. College students are evaluated on various measures, including exams, quizzes, homework accuracy, homework completion, attendance, and participation. Some students with presenting mental health issues tend to procrastinate and lack motivation to complete schoolwork. This behavior often leads to them falling behind in the course, which may lead to the need for the student to withdraw from the course. If a student's symptoms and negative impacts on health are not addressed, the cumulative effect of continued difficulty with performance at university may result in dropping out of university altogether. Beyond this, long term outcomes also may include difficulty sustaining and maintaining stable work and meaningful relationships, and in meeting goals (Eisenberg et al., 2011).

Individuals are identifying with symptoms of and disorders of mental health at an increased prevalence when compared to the past few decades (Eisenberg et al., 2011; Lattie et al., 2019). The increased prevalence of students with mental health also means that practitioners and universities need to increase the rate at which university students are helped. Various services universities can implement and recommend, include one-on-one counseling, intervention, and medication management.

College students who experience symptoms of and disorders related to mental health tend to have difficulty with academics, well-being, and avoidance (Dunlop et al., 2013; Pascoe et al., 2020). Individuals who seek treatment are at an increased rate of success compared to individuals who do not receive treatment. Within treatment, individuals can work to develop strategies for dealing with anxiety, depression, and stress (Lattie et al., 2019). Types of treatment commonly used with individuals experiencing psychological distress include Cognitive Behavioral Therapy (CBT), Dialectical Behavior Therapy (DBT), and Acceptance and Commitment Therapy (ACT) (Cherry et al., 2019; Dunlop et al., 2013). Within these treatment frameworks, individuals learn coping mechanisms and healthy social relational skills.

In a meta-analysis conducted in 2014 comparing different treatment modalities, ACT had the lowest number of empirical studies completed on it when compared to CBT and DBT (Bass et al., 2014). One reason for this may relate to the introduction of CBT in the 1960's, followed by DBT in the late 1970's, and ACT in the late 1980's. CBT has been widely used to treat various psychological disorders, including anxiety and depression. DBT has been used to treat emotional regulation issues, like self-harm behaviors, trauma, and personality disorders. ACT has been used to treat various psychological disorders, like CBT, as well as addiction, compulsive behaviors, and pain. In ACT, experiential avoidance, or inflexibility, is the main problem addressed with a goal of increasing flexibility, particularly psychological. Individuals who have higher levels of distress (e.g., anxiety and depression) experience greater inflexibility (Cherry et al., 2021). ACT has been used and adapted clinical, medical, school, and therapeutic settings. It has been used with a variety of age groups.

Need for College Mental Health Services

According to the American College Health Association's (ACHA) 2022 survey of undergraduate students, which received responses from over 50,000 participants, 79% of students reported experiencing moderate to high levels of stress (American College Health Association, 2022). Among college students, nearly 35% of students indicated a diagnosis of anxiety and 27% indicated a diagnosis of depression. Post-traumatic stress disorder (PTSD) rates were 8% and other mental health conditions were experienced by 17% of students. One third of all students surveyed indicated that anxiety had a negative impact on their academic performance and one fourth of all students surveyed indicated depression had a negative impact on their academic performance.

Of the college students who have diagnoses of anxiety and depression, 12% of students did not seek treatment, medical or therapeutic (ACHA, 2022). However, approximately 75% of students experiencing anxiety and depression sought some form of treatment from a healthcare provider. No information of time spent receiving services was reported. A roughly even number of students reported use of either medicine only or therapy only, whereas 48% with anxiety and 55% with depression sought both treatments simultaneously. Across genders, individuals identifying as trans or gender non-conforming experience symptoms of mental health at rates one third to one half higher than their cis women counterparts and three times higher than their cis men counterparts. Additionally, individuals identifying as LGBTQIA+ experience higher rates of negative mental health symptoms compared to their straight peers (Campbell et al., 2022).

College students within minority racial and ethnic groups had increased rates of worsening mental health, like students of all races and ethnicities (ACHA, 2022; Campbell et al., 2022). Percentages of students seeking therapeutic help was highest among white students, with

nearly 40% of White identifying students experiencing mental health issues seeking therapeutic treatment. Black, Latinx, and multiracial students were less likely to seek services with under 30% of individuals seeking therapy as a treatment option for mental health issues. Individuals in minority populations tend to have more barriers to access treatment, and poorer quality treatment when it is received (Mongelli et al., 2020). Additionally, treatment dropout rates are higher for minority groups.

Many students who experience a mental health disorder do not seek formal treatment for several reasons, including financial costs, accessibility, and stigma (Harrer et al., 2018; Viskovich et al., 2023; Watkins et al., 2011). Counseling services often come with a financial component, which can be a barrier to those in need seeking help. Many universities offer services at little to no cost to students, which is helpful in combating the cost of those seeking services elsewhere in the community. Up to 80% of college students report awareness of these services on their campus; however, only half of these students report that their school is "doing enough" to support students' mental health needs (ACHA, 2022).

Of the students who report fair or lower levels of mental health, only 20% sought help through campus services (ACHA, 2022). Over a third of students reported that cost and lack of insurance were reasons for not seeking help. Another third of students reported discomfort with the idea of asking for help. Beyond these reasons, students also run into the issue of accessibility of services. Student health services often have limited clinicians or limited ability to meet the needs of every student in need of services. Additionally, clinicians who do see clients often have a full caseload and therefore cannot see new clients. Students who are receiving services likely receive them from a clinician in training or a clinician with limited experience and are only allotted a few sessions, typically 6-8 sessions. After this, the clinician can no longer see them due

to reaching the cap of available sessions. The demand for services is at its highest in decades (Radfar et al., 2021; Watkins et al., 2011; Winkler et al., 2020), and the availability of individuals offering services does not meet this need. Because of this, it is typical for there to be a wait time between when students need services and when students begin receiving services.

The mental health field has come a long way; however, stigma still exists around the experience of psychological distress and treatment services, such as counseling, for this distress (citation). Medication seems to be more widely accepted as a treatment option; however, researchers have found that pairing medication and some form of counseling yields the most effective results for "fixing" or treating various mental health problems (Kamenov et al., 2017). All that to say, counseling is more stigmatized than medicine and therefore, can add a layer of complexity for students navigating their issues. Stigmas around mental health can create a barrier for students seeking help (Javed et al., 2021; Parcesepe & Cabassa, 2013). Additionally, full-time students have busy schedules, and balancing the demands of a full course load while addressing mental health difficulties can pose issues. Likely, mental health problems fall to the back burner. These stigmas exist more so among male university students, first-generation students, and culturally diverse students (Javed et al., 2021; Parcesepe & Cabassa, 2013).

Issues of cost, availability, and stigma pose various issues for students in crisis situations and those dealing with immense psychological distress. College students tend to fall into one of three categories, students who are in a healthy mind space but could benefit from knowledge of mental health and mechanisms, students who experience symptoms of or have a psychological disorder but may not be seeking formal help, and students who are at risk for developing a mental health disorder later in life (Souza Pinto et al., 2014). An additional category includes students with a mental health disorder who are seeking help or receiving help. It could be helpful

to direct students to an easily accessible, low-commitment resource that offers knowledge of mental health disorders, teaches skills for dealing with distress, and offers a variety of coping mechanisms that students can try.

Acceptance and Commitment Therapy

Acceptance and Commitment Therapy (ACT) is a third-generation form of Cognitive Behavioral Therapy (CBT). Second and third wave CBT both focus on behavior change; however, third wave CBT shifts from a focus on current difficulties in thought patterns to a future oriented goal focus (Brown et al., 2011). ACT maintains the goal of CBT that seeks to change thoughts and feelings; however, it achieves this by seeking to change the context and purpose of individuals' private events to "diminish the behavioral impact" (Greco et al., 2008; Hayes et al., 2006). Therefore, ACT is a functional form of CBT aimed at decreasing the emotional, mental, and physical impact of our "thoughts, feelings, memories, and physical bodily sensations" (Greco et al., 2008). Individuals tend to create links or narratives between cognitions, feelings, and behavior. However, if these narratives become too rigid and inflexible, our mind and behavior are negatively impacted which can impair personal functioning. Due to the impairment, ACT seeks to change the context within which these negative events function. The foundation of ACT is psychological flexibility and an identification of values that guide behavior.

Relational Frame Theory (RFT) is the conceptual basis of ACT. RFT is the knowledge of how ACT processes, such as cognitive defusion, acceptance, and present moment awareness, work individually and in unison (Hayes, 2004). This theory is "a behavioral account of language and cognition" and relates to the ability of humans to relate things, objects, or people to each other. There are two methods of relating things within this theory: relational responses and

derived relational responses. Relational responses do not have to be taught directly, for example, it is as simple as what comes to mind when prompted to think of a pencil. The response is a relational frame. However, the latter are those relationships that are derived through and learned through operant conditioning. An example of this would be to think of how a pencil and a lunchbox are alike. To respond to this prompt, one needs to use multiple relational frames to relate the two.

Relational frames are the ways in which we humans form connections between concepts and ideas (Hayes, 2004; McEnteggart, 2018). There are four types of relational frames used to form relationships between concepts, including causal, coordination, comparative/evaluative, and deictic. Causal or temporal relationships are the if-then relationships; they exist when one event or variable triggers another because of a direct relationship between the two. Coordination relationships are those that involve drawing similarities between two concepts. Comparative and evaluative relationships are used to evaluate differences between two concepts, like smaller than or bigger than. A deictic relationship is a word or concept where meaning depends on the context in which the word is used (Cambridge Dictionary, 2023). This relation can be understood from the perspective of the speaker, such as “I and you,” “here and there,” and “now and then” (Garcia-Zambrano et al., 2019).

New frames or transformations of frames can be formed/occur when no contingency for a concept exists (Hayes, 2004; McEnteggart, 2018). For example, a child is excited to go to sleep. Then they learn that they must sleep in the dark and become scared of sleeping. The frame the child formed for sleeping was transformed because no contingency was present. Transformations of frames like this can lead to inflexibility and experiential avoidance. RFT relates to ACT because when transformations like this exist, and avoidance behaviors and inflexibility of

thinking follow, ACT seeks to create flexibility by adding more frames to one's arsenal. Instead of only thinking about fear when thinking of sleeping, one can create a new relationship with sleeping. For instance, sleeping relates to coziness. When this relationship is formed, the one created between sleeping and darkness lessens, and flexibility increases. A central term in, and the main outcome of, the ACT model is psychological flexibility (Simon & Verboon, 2016).

ACT is built upon RFT because individuals can become stuck in certain created frames and associations between concepts. Being "stuck" is associated with behavior that is rigid and inflexible. Psychological inflexibility is defined as the "rigid dominance of psychological reactions over chosen values and contingencies in guiding action" (Cherry et al., 2021; Simon & Verboon, 2016). It can also be understood as suffering, distress, worry, and rumination of past and future events that cause individuals to make unfair/unrealistic personal judgements as well as judgements of others. Populations who experience depressive and anxious symptomatology are at higher risk for inflexible thoughts, behaviors, and emotions. Psychological flexibility is the ability to choose behavior and maintain the pursuit of identified life goals in accordance with one's values, despite the presence of distress (Bass et al., 2014; Kashdan et al., 2020; Simon & Verboon, 2016). It is associated with positive and functional outcomes for general well-being and for reduced psychopathology (Cherry et al., 2021).

The purpose of ACT, based on relational frame theory, is to promote flexible thinking and to create meaningful, values based and guided action, while accepting the distress, discomfort, and pain that is a result of living. A major focus is on transforming relationships between events and feelings, preexisting or new. ACT is composed of, and relies on, a model called the Hexaflex. This model is constructed of six constructs, all interrelated, working together to explain the relationships between mindfulness, acceptance, and committed value-

based action. The six pieces within the Hexaflex model are as follows: attention to the present moment, acceptance, cognitive defusion, self-as-context, values, and committed action.

ACT and the Hexaflex Model

Attention to the Present Moment. Mindfulness is a key construct within the ACT model. Mindfulness means being present and having awareness in the current moment and within your present setting. It is being fully aware in the moment, in opposition to living in the past or in the future. Thoughts of occurrences in the past and stories told about future events distract us from maintaining awareness in the present. ACT posits that to change our mindset, and narratives we tell about ourselves and others, we must maintain awareness and grounding in the present moment. Attention to the present moment allows us to engage in behavior and thoughts that are productive for our well-being.

Acceptance. Acceptance in terms of the ACT model is in direct opposition to experiential avoidance, which is understood to be the avoidance of or blocking of undesirable events, thoughts, or feelings. Therefore, acceptance is a willingness to be open to experiences, feelings, and thoughts of the present moment. It is an approach to be flexible and open with intentionality.

Experiential avoidance comes from the literature on cognitive fusion and is known as the attempt to change the impact (e.g., “form, frequency, situational sensitivity”) of a mental event (Greco et al., 2008; Hayes et al., 2004; Simon & Verboon, 2016). This attempt persists even though it can create difficulty in how we act. In other words, experiential avoidance is an avoidance and an unwillingness to face an undesirable private event or experience, most of the time being a negative emotion or uncomfortable situation (Cherry et al., 2021). Nearly everyone has learned or participated in this process of avoidance to achieve emotional control, whether

conscious of it or not (Greco et al., 2008). Individuals with strong reinforcement and learning histories, and ones sanctioned by cultural and societal contexts are difficult to change. The common belief is that negative feelings are bad and should be avoided, regulated, or changed. However, many methods humans have used to control or regulate these negative thoughts, feelings, or memories often include avoidant behavior, favoring relief in the short term while neglecting harmful and inflexible behavior patterns that lead to increased emotional difficulty in the long term.

Short term relief may look like distraction and suppression of thoughts; however, over time the private event avoided becomes more salient and more frequent (Hayes, 2004). If humans are reinforced in the short term for avoiding a negative experience, and it works to produce a favorable feeling, they are more likely to avoid the same or similar event in the future. It then becomes a loop that is increasingly resistant to change. Chronic experiential avoidance of events makes it increasingly difficult to lead value-based lives. It can be and is often associated with the presence of psychopathology, in the forms of anxiety and depressive symptoms, and with lower levels of well-being and reported life and work satisfaction. Facing a negative event, feeling, or emotion would be the alternative, which produces discomfort in the short term. However, continued behavior of facing negative emotions is important and is often associated with positive psychological outcomes.

Cognitive Fusion and Defusion. Cognitive fusion is a term within the ACT framework that is used to describe how inflexible intrusive thoughts and feelings, such as narratives, rules, and "derived relational networks'' can affect/set our behavior and experiences (Hayes et al., 2006). Examples of rules include "I can't," "I have to," or never and always. Derived relational responding is the ability to derive or form a relationship between objects that are not explicitly

taught. For example, a baby learns to label the object of a block as "block." The derived relational network, that was untrained and is learned through operant conditioning, is when the baby understands the word "block" as the object of a block.

Cognitive fusion is defined as getting caught up or "stuck" in the contents of our negative thoughts and feelings and accepting them as true (Greco et al., 2008). Because of this, individuals begin to behave in a way that seeks to control and avoid such thoughts/feelings. This behavior is known as experiential avoidance which is a cause of behavioral ineffectiveness, such as resistance to change, negative attitude, and lack of personal responsibility (Simon & Verboon, 2016). Behavioral ineffectiveness is linked to impairment in everyday functioning and is unproductive for long term success (Hayes, 2004; Simon & Verboon, 2016).

Cognitive Defusion, on the other hand, is the process of getting "unstuck" from harmful and unproductive thoughts, narratives, and rules. Language is helpful but often it can be easy to fall into negative thought patterns, comparisons, and questioning of relational standings (Hayes, 2004; Simon & Verboon, 2016). Language helps us to describe and predict what others may be thinking of what we said, did, or will do. It also causes us to label ourselves and others in ways that may be unrepresentative of the truth/reality and harmful to ourselves, relationships, and productivity. On the other hand, cognitive defusion is the ability to create distance from intrusive and unproductive thoughts and narratives. Using language intentionally, one is enabled to achieve a different perspective, allowing for recognition that the thought is just a thought and a part of a mental event. When defusion occurs, it allows for more flexible thinking for responding to events and behavior.

Self-as-Context. This piece within the model describes how humans can observe their own awareness and are aware of having thoughts (Hayes, 2004; Simon & Verboon, 2016). The

observing mind, or a self that is aware it is having a thought, notices the thoughts that one has**,** which could be as simple as "I am having a thought." Within the ACT model, three senses of self are described including, the *conceptualized self, self-as-awareness,* and *self-as-context*. The conceptualized self is who we believe we are, including our ideas, thoughts, feelings, and narratives about our own identity. Self-as-awareness is related to being mindful and present in the moment. Self-as-context involves being aware of our conceptualized self, in the present moment, having thoughts.

Within the ACT model, the development of self can be improved with the use of deictic relations (e.g., understanding events through different relational perspectives) (Murthy et al., 2019). The conceptualized self, or self-as-content, is comprised of all the stories individuals tell about who they are. These "I am..." statements become beliefs and at times, function to restrict our behavior. For instance, an individual might say "I can't go because I am scared of heights." The use of the observing self, or self-as-context, with the conceptualized self's "I am..." stories foster defusion and acceptance. Once our self-as-context is formed, we can more easily create distance from our conceptualized self and unproductive thoughts about the past or stories about the future. This distance allows us to settle into the present moment more easily.

Values. Values are a key component within the ACT model. Individuals who practice within the ACT model are encouraged to choose values, which can be described as principles and beliefs that one deems important. The model states that values differ from simple wants and desires but differs also from morals and ethics (Hayes, 2004). Values hold special and unique meaning for someone, and therefore differ from individual to individual. Values guide action, are judged to be helpful in providing direction, and ultimately help individuals behave in a way that will meet their goals. For values to make the most impact, one never has to justify them, they are

chosen without influence from others, they must be accessible in the present moment, they should be prioritized, and should be held loosely based on one's life stage to avoid feeling restricted by them.

Committed Action. This is the last piece of the Hexaflex model. The goal of ACT is to create values-based action that contributes to a values-based life (Hayes, 2004). Committed action is when values become habits, or sustained behaviors with actionable steps to achieve short-term and long-term goals. When one identifies their short-term and long-term goals, they can also identify potential barriers that may set them back along the way. The above constructs within the Hexaflex model, like acceptance and defusion, make moving through the barriers in a manageable way, keeping in mind one's values behind their goals. Goals can be more easily achieved when there is a principle or value guiding the action steps needed to achieve them. One is based or rooted in their core values and achieving goals in accordance with their values-based life.

ACT is used to treat individuals with varying presenting problems, such as stress, burnout, anxiety, depression, and eating disorders. It can be used with individuals, groups, classrooms, and in the workplace. The goal of ACT is to increase an individual's ability to create a life with meaning, while accepting that life also comes with inevitable pain. Some of ACT emphasizes stress management, increasing one's stress tolerance, and use of coping strategies. By targeting stress (e.g., general and educational) and wellness (e.g., relaxation, mindfulness), ACT increases psychological flexibility.

Treatment Targets for ACT Interventions

Perceived Stress. Stress is experienced when the demand of a situation exceeds our resources available to cope with it (Crosswell & Lockwood, 2020). Responses to stress vary

dramatically, depending on emotional, mental, and physical states, as well as perception. Perceived stress is similar. Sometimes stress can feel exacerbated when one does not feel equipped to deal with it even when they have resources available. Stress can be caused from external or internal events. Stress can be perceived in various ways depending on the individual and their outlook on life events. An individual who views stress in an unproductive manner, lets the stress consume them. Someone who can create distance from the event and recognize the resources they have, to deal with events, likely views the stress as a minor bump in the road. Individuals with psychopathologies tend to have a more difficult time with stress and tend to view the stress as more major than is realistic. For instance, one may feel stressed or overwhelmed with an impending deadline and spend much time wasted in unproductive thoughts of how they will never complete it in time. This time could be better spent developing a timeline or outline of an upcoming paper/assignment.

Well-being. Another target for the treatment of college students' mental health is well-being. The dual-factor model of mental health posits that mental health results from both positive indicators related to well-being and negative indicators related to psychopathology (Suldo & Shaffer, 2008). Well-being is a sense of healthiness or freedom from distress, stress, and symptoms of psychopathologies. Well-being can be achieved in various facets of one's life, including social, physical, mental, and emotional. It can be thought of as a stasis, or ideal state of equilibrium, for the human body or condition. Well-being is connected to positive outcomes related to work, school, hobbies, values, and relationships. When one is well and achieves a general sense of well-being, daily functioning and functioning across settings is less impacted by stress, unproductive thoughts, or symptoms from mental health disorders.

Well-being and a sense of well-being differ in that one's perception of an event, relationship, and life is subjective (Suldo & Shaffer, 2008). What feels well for one person may be another person's definition of unwell. However, common methods of enhancing well-being include having and maintaining a close network with friends and family; an intimate relationship with a significant other(s); regular exercise, diet, and sleep; fulfilling career; financial security; optimistic goals; hobbies (values-based living); and an overall positive self-concept (Czyzowska & Gurba, 2021; Ruggeri et al., 2020). These factors can be and often tend to be interrelated. Based on life stage, a person's career may not make them enough money (e.g., graduate student). However, one's long-term goals that will be achieved after a graduate program (e.g., career stability and fulfillment, partnership) and relationships made within your graduate program may make up for it. Enough money can be difficult to measure, but essentially means that money up to a certain amount enhances well-being because it provides you with the resources needed for housing, food, transportation, and meaningful living. Some researchers have shown that personal earnings of up to $80,000 a year are associated with significantly lower levels of negative feelings, like sadness and stress (Killingsworth, 2021). Salaries higher than this were associated with significantly higher levels of positive feelings. This finding indicates a tendency for life satisfaction to increase as income increases. The effect of increased income on life satisfaction eventually plateaus.

To achieve well-being, one can focus on spending time with friends and maintaining these relationships, making time for exercise and healthy meals, setting realistic and attainable long- and short-term goals, finding value in work, and finding rewarding activities that are aligned with personal values (Czyzowska & Gurba, 2021; Ruggeri et al., 2020). College students living on or near a university campus can engage in these behaviors. Many times, lack of

awareness that these factors produce well-being is a barrier. Additionally, students may wait until they experience negative feelings of stress or of mental health to consider factors to increase their well-being. Other barriers to achieving well-being factors tend to be related to inflexibility in thoughts, avoidance of situations or taking risks, and inability to accept the current situation to focus on behaviors that could help contribute to success in the future.

University counseling centers have therapists who focus on wellness and stress, but there are limitations to accessing this type of treatment. Universities experience barriers to providing accessible treatment due to a lack of available therapists, limited session length, and focus on triage services. Alternative forms of services that promote wellness, lower levels of stress, flexibility, acceptance, and other areas of positive mental health exist; however, they also may not be accessible to college students. Web-based programs and interventions may be a solution that fits the unique needs of students on college campuses.

Web-based interventions offer advantages for many groups of students, and in particular students in higher education. Students seeking degrees at higher education institutions are familiar with and rely on technology and web-based navigation tools daily. Mental health resources, consumed for information, curiosity purposes, or to help with one's current mental state, can be offered via the web. Web-based interventions offer accessibility for students to navigate the intervention on their own time. Students tend to understand their schedule best and know when they will have available time to engage in an intervention and activities. Further, web-based interventions allow for a breadth of information to be presented to a wide array of individuals.

Review of Web-Based Interventions

Several web-based interventions exist that specifically target college students' mental health. These interventions focus on decreasing student rates of depression, anxiety, stress, and psychological distress, as well as increasing well-being. Based on a meta-analysis and systematic review, web-based interventions have variable effectiveness and therefore, potential to be effective (Garrido et al., 2019; Harrer et al., 2018). Many studies produced results consistent with improvements in mental health outcomes; however, most of the studies demonstrated small effects on depression, anxiety, and stress. Moderate effects were found for symptoms related to eating disorders and academic and social functioning.

Garrido et al. (2019) conducted a systematic review of 89 digital mental health interventions (DMHI). They categorized DMHI features into four categories, including social support, online/computer based, useful content, and look and feel. Within social support, users expressed positive reviews of the interaction with peers and practitioners when using a DMHI, while others preferred in person contact. Additionally, many users liked the feature of privacy that the DMHI provided. Those who liked the social support aspect tended to be familiar with more traditional therapeutic relationships with practitioners. However, those who preferred privacy over the social aspects tended to be less exposed to treatment and had more stigma surrounding their decision to partake in the service. Moderate effects were found within DMHIs that involved regular interaction with a therapist or completion of the intervention in a supervised setting compared to no effects found within DMHIs that did not include regular interaction. The presence of moderate effects could be due to the forging of a therapeutic alliance.

Participants of online interventions identified many positive features, such as being able to complete the intervention on their own time, at their own pace, and as a part of their daily

routine (Garrido et al., 2019). Additionally, users liked the accessibility and thought that the intervention seemed like a nice, non-school related activity. Another feature that users tended to rate highly was the usefulness of the content. Users liked content that taught them skills for problem solving, acceptance, coping with stress and anger, time management, and about general mental health information. Users expressed liking the look and feel of many DMHIs, including the easy navigation, video components, relatable content, and interactive components.

Studies with lower rates of effective results often lacked usability measures and were not collecting feedback from participants. Studies that included usability measures examined the relationship between ratings and attrition. Attrition is associated with user experience. Specifically, studies with higher rates of attrition had users who felt the program was not made for them, was not useful in crisis situations, and did not address issues the user most cared about (Lattie et al., 2019). Additionally, many users did not like educational content, citing that it was boring, hard, or repetitive, lack of varied and personalized content, and difficulties navigating the website. Additionally, users disliked content that felt patronizing (Garrido et al., 2019). Studies reported completion rates based on number of modules completed as attrition rates tended to impact overall retention and completion rates (Garrido et al., 2019).

ACT can be and is typically offered and implemented in a one-on-one therapeutic setting. Because it was developed based on cognitive behavioral therapy principles, which is typically utilized in one-on-one settings as well, this has been the historical use of ACT (Brown et al., 2011). Several researchers have adapted ACT exercises to be used in small group and class wide settings (Holland & Hawks, 2022). Due to the effective nature of this, researchers began identifying ways to make these interventions more accessible to individuals. One way to increase accessibility to resources and exercises is to adapt them to a web-based format.

The YOLO Program. Researchers created a web-based ACT intervention, called the YOLO Program, which is focused on promoting mental health for students attending higher education institutions (See Table 3 and Table 4 in Appendix C; Viskovich & Pakenham, 2018; Viskovich & Pakenham, 2020). This program is comprised of four modules, the first focused on the last two ACT processes, Values and Committed action. Within this module, participants are introduced to definitions for values, values exercises including the 80-year-old birthday speech, committed action exercises including making SMART goals, and various videos. Following this, participants have a reflection prompt asking them about a value they wish to express and why. The second module introduces cognitive defusion, with various introductory and exercise videos (e.g., leaves on a stream, hands as thoughts), and tasks. At the conclusion of this module, participants have a reflection on using defusion to create distance from themself and their thoughts. The third module is on Acceptance and the fourth module is on Mindfulness (attention to the present moment) and the self-as-context or observer. As with the previous modules, participants receive information for definitions of constructs, watch several videos, and complete various exercises (e.g., passengers on the bus, relaxation observation exercise) to practice acceptance and mindfulness. They then complete content reflections following exercises they completed.

Participants targeted for this intervention were required to be fluent English speakers and over the age of 18. The intervention was conducted over four weeks, included pre and post intervention assessments of various outcomes, and ACT processes. Across these studies, findings suggest that the intervention promoted improvements in university students for most primary outcomes, including academic performance, depression, life satisfaction, self-compassion, stress, and well-being, to name a few, compared to the waitlist control group. The effects of the

intervention were stable at a 12 week follow up. Intervention participants also demonstrated improvements across ACT processes of acceptance, cognitive fusion, education values, valued living, and present moment awareness.

A limitation specific to this program is that the authors of YOLO are the only ones to conduct research on the program. Additionally, only two studies have been conducted on the original YOLO program.

A Bite of ACT. A Bite of ACT is another web-based intervention, adapted from the pilot YOLO Program (See Table 3 and Table 4 in Appendix C; Edwards et al., 2019). Researchers adapted the modules presented to participants, and the order in which the modules were presented. No follow up study with program effectiveness has been published. Within this online intervention, module one is called Values clarification. Participants are introduced to ACT, its processes, values, and an exercise. Module two introduces participants to mindfulness, with a series of videos, an exercise, and a reflection. Module three covers acceptance and cognitive defusion together, as opposed to two separate modules in the YOLO program. Within this module, videos are presented, and participants engage in two exercises each followed by a reflection. Module four concludes the program and covers self-compassion and commitment. Participants complete one more exercise and reflection. At the beginning of the program, participants were provided a small journal. At the conclusion of the program, they reflect on what went well and not so well in the journal, as well as how they will use their skills and learned information in the future.

ACT on College Life. ACT on College Life (ACT-CL) is a three-week, web-based program developed to prevent mental health issues in college students using Acceptance and Commitment Therapy (Levin et al., 2014). Participants included students enrolled in

undergraduate courses who responded to posted flyers on their campus. They were randomized in the treatment or waitlist control group. Participants completed two lessons, which used various forms of media, including audio, graphics, and animations. The first lesson, exploring your values, was aimed to help participants define, clarify, and reflect on their values and goals. Within this lesson, participants were presented with information, completed knowledge quizzes, and completed values and goal setting exercises. The second lesson, dealing with barriers, focused on exploring internal barriers and control strategies, challenges with acceptance, and included exercises (e.g., values bulls' eye; and vs. but; pain vs. suffering). After completion of each lesson, participants received emails tailored to them, checking in on their set goals and providing information and tips for completing exercises.

Measures used in this prototype study included the System Usability Scale (SUS); ACT Knowledge Questionnaire; Depression, Anxiety, and Stress Scale (DASS); Acceptance and Action Questionnaire-II (AAQ-II); and the Personal Values Questionnaire (PVQ) (Levin et al., 2014). Results suggest participants had high acceptability rates for the program. Additional findings indicate improvement in intervention participants' ACT knowledge, levels of depression and anxiety, and values toward education compared to the waitlist control group.

LifeStories. LifeStories is a four-week video-based self-help ACT intervention. This intervention consists of story vignettes of participants describing their use of ACT related skills to aid in the treatment of their depression (Gaudiano et al., 2020). The sessions are 20-30 minutes and communicate the ACT strategies using storytelling. The themes covered in this intervention include cultivating awareness of mood and symptoms of depression, clarifying personal values, developing acceptance and nonjudgement toward personal thoughts and

feelings, and living mindfully. This intervention was found to be useful in treating depression and disseminating engaging information to participants.

Participants were sent a video or a DVD each week, based on preference (Gaudiano et al., 2020). They were provided a supplementary workbook with activities to work through while participating in the intervention. They also completed self-report questionnaires weekly, following each video. Participants (n=21) found the intervention engaging and useful. Results suggest small effect size changes for psychological flexibility and some improvements in depression.

Limitations of Existing Web-Based ACT Interventions.

The studies discussed above yielded promising results, however, limitations exist. One group of researchers noted small sample sizes, limited modules, and limited geographic focus as limitations in their intervention (Levin et al., 2013). The small sample size (n = 76) was intentional because researchers wanted to see the difference between engagement across institutions (e.g., community college and a local university). This study only included two modules. The geographic focus was limited to two local higher education institutions. Additionally, they stated that variables such as employment were not measured and may have added to covariance. The researchers were concerned about the impact full-time employment on student engagement in the intervention.

Limitations from more recent web-based ACT interventions include a lack of control group, high percentage of female participants, a high dropout rate contributing to missing data, and a brief follow up assessment (Edwards et al., 2019; Gaudiano et al., 2020; Viskovich & Pakenham, 2018; Viskovich & Pakenham, 2020). The high dropout rate was noted as a limitation, although researchers have found that students do not need to engage with a complete

intervention to benefit from web-based interventions (Viskovich & Pakenham, 2020). Researchers stated that the brief follow up period limits knowledge of whether the effects of the intervention were sustained.

The Life Stories researchers noted that participants involved had varying severity levels of depression symptoms (Gaudiano et al., 2020). Due to the small sample (n = 40), no subgroup differences could be assessed between severity groups. Researchers also noted that participants continued with any earlier medications or therapeutic interventions, which may have affected the outcomes of this intervention. Additionally, the comparison group received videos on self-help. These videos were not previously assessed for effectiveness and the impact of this on the control group is unclear.

Statement of the problem

This proposed study will examine a web-based Acceptance and Commitment Therapy (ACT) intervention. Researchers of previously conducted studies reported limitations such as sample size, limited module content, limited geographic focus, high percentage of females, and high attrition rates exist among previously implemented ACT interventions. The proposed study expects many of these limitations to exist within the targeted population. However, efforts to increase the percentage of male participants, create more modules, and lower attrition rates were made. Using a group design, university students will be randomly assigned to either an intervention condition or a waitlist control (WLC) condition. The primary difference in the two conditions is that participants in the WLC group will receive brief, educational materials on mental health while on the waitlist, whereas the intervention group will be engaging with exercises and information related to ACT. Student outcomes and perceived stress will be measured using the Mental Health Continuum, the Perceived Stress Scale, the Flourishing

measure, the Acceptance and Action Questionnaire, the Cognitive Fusion Questionnaire, the Personal Values Questionnaire, the Engaged Living Scale, and the Mindful Attention Awareness Scale. This research will begin to identify the efficacy of this program. In service of that goal, the following research questions will be addressed:

1. Are there differences in undergraduate students' level of perceived stress between those who receive a self-guided psychological flexibility intervention and those who receive supplemental mental health tips as measured by the Perceived Stress Scale and the Mental Health Continuum, Short Form? Based on previous research, web-based ACT interventions showed small to moderate effects related to anxiety, depression, and stress levels (Garrido et al., 2019; Harrer et al., 2018). Due to this finding, we hypothesize that students in the intervention group will have lower levels of anxiety, depression, and stress than those in the WLC group.
2. Are there differences in undergraduate students' psychological flexibility between those who receive a self-guided psychological flexibility intervention and those who receive supplemental mental health tips as measured by the AAQ-II, CFQ, ELS, MAAS, and PVQ-2? Based on previous research, web-based ACT interventions support improved mental health skills like acceptance, defusion, valued living, and present moment awareness (Viskovich & Pakenham, 2020). Thus, we hypothesize students in the intervention group will have increased psychological flexibility skills than those in the WLC group.
3. Are there differences in the impact of the intervention based on the student's level of stress? Participants will be sorted into groups based on the PSS cut-off scores. We

hypothesize that students in the high stress group will benefit more from this intervention than students in the low stress group.

4. Are there differences in undergraduate student attrition rates between those with little presenting mental health concerns, those with moderate concerns, and those with severe concerns? Research does not inform this question, but personal experience was used to hypothesize that attrition rates will be higher for those with severe mental health concerns.
5. Do participants perceive the program to be effective? We hypothesize that individuals will find the technology usable and the program acceptable.

Chapter II

Methods

Participants and Setting

The Institutional Review Board (IRB) has reviewed and approved the research study. We recruited students attending a university in the Southeastern United States for participation in this study. Participants met the following eligibility requirements: 18 years of age or older and enrolled as a part-time or full-time student at one public university. We did not exclude participants for any reason. Recruitment procedures included class announcements (in person and through an online learning platform, e.g., Canvas) and emails to students. Any undergraduate student at the university was eligible to participate. Students were recruited over a 3-week period at the beginning of the spring semester. Once recruitment was completed, participants completed a pre-assessment indicating present levels of stress, well-being, and symptomology related to diagnostic disorders. We also collected demographic information and GPA. A power analysis was conducted to determine the target number of participants for the study is 60.

The setting of this study varies given the web-based modality. Students were asked to indicate locations where they completed the program (e.g., home, coffee shop, library) at the conclusion of the program.

Materials

Participants had a quiet workspace with access to a computer with internet access and working audio, moderate strength internet connection, and access to the intervention materials. Intervention materials include login information for the Canvas page and all posted content on the Canvas.

Instruments/Dependent Variables

Most measures were used for both pre and posttest, and some were used for posttest only. The following information/measures were collected/used: demographic information, the Perceived Stress Scale, the Mental Health Continuum, the Flourishing measure, the Acceptance and Action Questionnaire, the Cognitive Fusion Questionnaire, the Personal Values Questionnaire, the Engaged Living Scale, and the Mindful Attention Awareness Scale. The System Usability scale and the Acceptability Questionnaire were used only as a posttest measure.

Demographics. Characteristics of gender identity, age, race, ethnicity, level of degree, state of permanent residence, college/department affiliation, GPA, and employment were collected. Additional information was collected regarding prior mental health diagnoses and contact (on-going or prior) with a mental health professional. A full list is included in the Appendix (see Table 1, Appendix C).

Participation and Attrition. The researchers who created ACT-CL indicated that most individuals who dropped out of the program completed the post survey (Levin et al., 2014). For this reason, participation and attrition were measured across time points, at the end of each module. Completion data was collected through participants' completion of activities, quizzes, and reflection discussions on Canvas. Participants' total time spent on each module and on the Canvas page was totaled. At the end of all 4 modules, participants were divided into two groups based on participation time. Participants who spent an average of 5 minutes or less on a module were assigned to the low participation group. Participants who spent an average of 5 minutes or greater on a module were assigned to the high participation group. Attrition was measured as those who completed some modules and did not complete any following modules or the post-survey.

Instruments

PSS. The Perceived Stress Scale (*PSS*; Cohen et al., 1983) was designed to measure an individual's perception and appraisal of the extent to which daily life events are deemed stressful (e.g., In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?). This measure consists of ten items and uses a five-point scale. Responses range from 0 (Never) to 4 (Very Often). Responses are scored and totaled, with total raw scores ranging from 0-40. Results of responses are placed into one of three categories, with higher scores indicating higher levels of perceived stress: low stress (0-13), moderate stress (14-26), and high stress (27-40). Responses across four items were reverse coded for accurate scoring. The ten item PSS has internal consistency scores of greater than 0.80 across validation studies (Lee, 2012). Other measures of reliability (test retest) were greater than 0.84 and is strong. Construct validity was measured through comparisons with a life-event scale and health/health-related outcomes. It was found to be acceptable.

MHC-SF. The Mental Health Continuum, Short-Form (*MHC-SF*; Keyes, 2009) measures one's emotional well-being and positive functioning (e.g., How often in the past month did you feel interested in life?). It is a 14-item scale, with six-point responses from 0 (never true) to 5 (every day). Higher mean scores indicate higher levels of well-being. This short form was reported to have good internal consistency, with Cronbach's alphas ranging from 0.79 to 0.94 (Yeo & Suarez, 2022). Concurrent, discriminant, and criterion validity were measured, and all indicated strong validity.

FS. The Flourishing Scale (*FS*; VanderWeele, 2017) measures states and outcomes related to one's functioning across domains of close social relationships, happiness, and life satisfaction, meaning and purpose, mental and physical health, character and virtue, and financial

and marital stability. The FS is a 12-item scale that covers six domains. The scale varies depending on which domain is being assessed. For the meaning and purpose domain, one item states, “Overall, to what extent do you feel the things you do in your life are worthwhile?” Responses range from 0 (Not at all worthwhile) to 10 (Completely worthwhile). Two indices exist: The Flourish Index includes the first five domains and the Secure Flourish Index (SFI) measures which includes the first five domains and the financial and marital stability domain. The SFI will be used in this study and the Cronbach’s alpha for the SFI is 0.875 (VanderWeele, 2017). Other examinations of reliability and validity indicate appropriate psychometric properties.

AAQ-II. The Acceptance and Action Questionnaire, version 2 (*AAQ-II*; Bond et al., 2011) is a seven-item measure of acceptance (e.g., My painful experiences and memories make it difficult for me to live a life that I would value). This measure uses a seven-point scale, with responses ranging from 1 (never true) to 7 (always true). Responses are totaled for scores ranging from 7-49. Higher total scores indicate lower levels of acceptance. Cronbach’s alpha for this seven-item scale is 0.89, indicative of good internal consistency. Test-retest reliability was acceptable. Discriminant validity was also acceptable.

CFQ. The Cognitive Fusion Questionnaire (*CFQ*; Gillanders et al., 2014) is a seven-item measure of cognitive fusion (e.g., It’s such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful). A seven-point scale is used to code responses ranging from 1 (never true) to 7 (always true). Higher total scores indicate greater cognitive fusion. The CFQ has excellent internal consistency, with an alpha score of 0.90. Construct and divergent validity were assessed and indicated acceptable psychometric properties.

PVQ-2. The Personal Values Questionnaire-II (*PVQ-2*; Blackledge et al., n.d.),

specifically the education values subscale, was used to measure success and motivation. This subscale includes written or listed responses of one's education values (e.g., participants write their values or select from a prewritten list) and a nine-item scale with items related to the value. Responses on this scale range from 1 (not at all for this reason) to 5 (entirely for this reason). Items related to values success are scored and used as a mean score. Items related to intrinsic motivation and extrinsic motivation are used as a ratio score. Lower scores indicate the value has greater intrinsic and appetitive motivation. Little reliability and validity data exists for this measure. However, it was used in an intervention which sought to increase ACT properties in college-aged students. Cronbach's alpha will be examined with this sample.

ELS. The Engaged Living Scale (*ELS*; Trompetter et al., 2015) measures values-based living (e.g., I believe that my values are really reflected in my behavior). It is a 16-item scale with responses ranging from 1 (completely disagree) to 5 (completely agree). Higher total scores indicate higher valued living. The valued living subscale within this measure has a high internal consistency, reporting a Cronbach's alpha of 0.89. Additional scores of validities (construct) show the scale has strong validity.

MAAS. The Mindful Attention Awareness Scale (*MASS*; Brown & Ryan, 2003) is a 16-item measure of present moment awareness (e.g., I find myself preoccupied with the future or the past). Responses are coded on a six-point scale, ranging from 1 (almost always) to 6 (almost never). Higher mean scores indicate higher levels of present moment awareness. The MAAS has a high internal reliability, with a Cronbach's alpha coefficient ranging from 0.83 to 0.87 across studies (Carlson & Brown, 2005; Edwards et al., 2019). Validity was shown to be acceptable (Carlson & Brown, 2005).

SUS. System Usability Scale (*SUS*; Brooke, 1996) is a 10-item measure used to evaluate

the website and applications within the web-based intervention (e.g., I found various functions in this system were well integrated). It is a five-point scale, with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Scores are totaled, with higher scores indicating higher system usability. Validity and reliability data of this measure suggest good psychometric properties (Gao et al., 2020).

Independent Variable

The intervention (see Appendix C, Table 2) was a self-developed, online mental health program and consists of four modules. Each module took participants 30 to 40 minutes to complete. All 4 modules were presented on a Canvas Catalog page. Each module presented information using the same format, which included a video created through PowToon. Like similar interventions created and included in Appendix C (Tables 3 and 4), the four modules focused on Values and Committed Action, cognitive Defusion, Acceptance, and Mindfulness and Self as Observer (Edwards, 2019; Viskovich, 2020). Within the Canvas page, students accessed all module content, presented sequentially (e.g., Activity 1 Video followed by Activity 1 Reflection, etc.). Each module presented information (visual and audio), exercises, and reflections specific to each ACT component. Specifically, content and exercises were presented via videos embedded within Canvas quizzes.

The first module was on Values and Committed Action. Activities included in the module include completing a values clarification exercise and the eightieth birthday speech. Participants explored a list of 24 values (e.g., VIA Character Strengths) and sorted them into categories of very important, quite important, and not important. This exercise aims to help individuals clarify values that are meaningful. Some values on the list include appreciation of beauty, creativity, humor, leadership, and spirituality. The Eightieth Birthday is another activity that helps

individuals identify their core values. Participants imagined three people who, on their eightieth birthday, stood up and gave a speech about them. The speech prompt challenged participants to identify what the individual stood for in their life. The descriptors the individual chooses to include in the speech are often their most important values areas.

Participants were then given the option to complete one of the following exercises for homework: SMART goal setting or the roadmap to success. Goal setting is another activity, specifically SMART goal training, that allows participants to identify goals, short term, and long term. They were challenged to make each goal specific, measurable, attainable, relevant, and time bound, which are characteristics that make goals easier to achieve. The Roadmap to Success activity is an activity that can be helpful in setting short term and long-term goals. Participants were tasked to create a roadmap of goals, including road signs as goals and actions that will help them meet their values-based goals.

The second module will focus on cognitive Defusion. Participants completed the Leaves on a Stream activity. This exercise helps a person notice their thoughts without creating an attachment to them. This activity brings an individual back to the present moment and is helpful for ruminative thoughts. Specifically, the Leaves on a Stream meditation uses imagery of placing a thought on a floating leaf on a stream, noticing the thought without further entertaining it. The second activity participants completed is called physicalizing the thought. This activity challenged participants to imagine a thought as an external entity, with the goal of separating their thoughts and feelings. This technique utilizes visualizations of the thought, such as giving thoughts color, shape, form, speed, etc. For homework, participants completed “I am” labels. This activity required participants to recognize a thought, such as “I am a failure” and reframe it to state “I am having the thought that I am a failure.” Over time, this lessens the attachment or

belief of the thought “I am a failure.” This activity helps individuals shift thoughts to boost flexibility and recognize the power of their words.

The third module focused on acceptance. Participants completed the following two activities: Passengers on a Bus and the Chinese Finger Trap. Passengers on a Bus is an activity that challenges participants to imagine or think about disruptive thoughts and thought patterns. Within this activity, participants practice acceptance and move toward their goals identified in the values section. Within this metaphor activity, participants imagine themselves as a bus driver and the passengers are all their thoughts. As the driver, they continue driving the bus to move toward the destination (e.g., their goal, value) even when the passengers can be unruly and negative. The second activity participants will complete is the Chinese Finger Trap. This exercise helps an individual physicalize their challenge. It allows them to imagine a tangible depiction fostering acceptance and acknowledgement of an issue instead of struggling with it. Using the finger trap (either imaginary or tangible), participants recognize the “grip” or strength of the thought. They are encouraged to increase their awareness of the thought to help “release” it from their mind. At the conclusion of this module, participants will be given a third activity to complete for homework, called the milk technique. This exercise reinforces Defusion from unhelpful thoughts and is helpful to address cognitive fusion. Individuals will repeat words related to their thoughts. Over time, this repetition weakens the attachment between the word and its meaning.

The fourth module was on mindfulness and self as observer. Two exercises completed in this module include: a breathing exercise and a self-compassion exercise. These exercises allowed participants to sit quietly and notice their breath. They also challenged individuals to express kindness to themselves and their thoughts. Following these activities, participants

completed a take home reflection. They listed ways they can practice mindfulness in their daily lives. Following these activities, participants will be finished with the intervention.

Procedure

Recruiting. Individuals from Psychoeducational Issues in Human Development, Professional Studies: Applied Education Psychology, Introduction to Psychology, and several Advertising courses were notified of the research study and given the opportunity to participate via an in-person recruitment announcement. Participants also received the recruitment information via a follow up online recruitment announcement through an online learning management system (e.g., Canvas). For the EDPY 210 course, the Canvas announcement was posted by a secondary instructor, who was affiliated with the course as an instructor; however, they had their own sections for which they taught. Students enrolled in specific courses will be offered points of extra credit for participating in the study. Those who choose not to participate were notified of an alternative outside assignment worth the same amount of extra credit. A reminder to participate was posted via Canvas announcement every week.

Pre-assessment. The recruitment announcement (see Appendix B) contained a link to the pre-assessment, in the form of a web-based survey created through Qualtrics. Participants needed a computer, access to the internet, and 20 minutes for completion. Students who agreed to participate had one week to complete the measures on Qualtrics. One week later, they received a reminder. Due to limited respondents, recruitment procedures were extended for one week. Participants received additional reminders to complete the pre-assessment. The link closed after 3 weeks. The first page of the online assessment contained a consent form. Individuals who agreed to participate moved forward to the survey to respond to a series of items and prompts for demographic information. Data from completed surveys was exported to SPSS.

Intervention group. Individuals who responded were contacted for participation in a self-guided, web-based intervention. Participants had the option to participate in the intervention. They could have revoked their consent to participate at any time. Consenting individuals were randomly sorted into an intervention group and a waitlist control group (described below) using SPSS. The intervention group was contacted through email with enrollment instructions to a Canvas page. At the researchers' university, the technical support professionals assisted in troubleshooting any issues participants had with accessing and using Canvas.

Prior to beginning the intervention, participants were assessed for eligibility through the pre-assessment survey. Criteria included older than 18 and enrolled at the affiliated university. After the eligibility assessment, participants were randomized into the intervention group or the waitlist control group. All participants completed a pre-assessment survey. This survey will include measures discussed above that will be directly targeted in the intervention. The intervention will consist of four modules, each consisting of two exercises. Each module will focus on increasing knowledge and skills related to Values and Committed Action, Cognitive Defusion, Acceptance, and Mindfulness and Self-As-Context. Sessions began with the presentation of information, which was followed by two applied activities, and one reflection. Each module will last 30-45 minutes each. Modules were broken down into sections, so that participants can work on it for 5-15-minute increments, taking breaks if needed. Participants were able to complete the modules at any rate; however, they were given a goal of completing the entire program within four weeks. Participants were able to complete this intervention from anywhere they had access to a computer, internet access, and their unique login code to access materials.

Modules were released Fridays of each week, for a total of four weeks. Participants

accessed the modules through their Canvas page. They received a reminder that the new module has been posted each Sunday. Participants received a weekly follow up announcement, via Canvas, three days later with a reminder to start and continue working on the module. Participation and completion of each module was monitored.

Following completion of each module, participants received a summary with key information of skills and exercises learned in the module. They also chose one of the presented homework assignments, or one that is assigned, to complete throughout the week. Following completion of all the modules, participants completed a post-assessment. This survey consisted of the same assessment questions, used to measure psychological well-being and ACT processes, they completed prior to enrolling in the intervention as well as additional social validity measures below.

Control group. A waitlist control group was needed since students are expressing varying levels of stress and may need services. They received the intervention once the intervention group completed all sessions and final assessments. While they waited for their peers to complete the intervention, they were offered resources on coping skills (see Appendix D).

Social validity. Participants completed the Acceptability Questionnaire, included in Table 6 (Edwards et al., 2019), which is an eleven-item questionnaire used to evaluate an intervention targeted at increasing psychological flexibility. Questions cover the topics of adverse effects, acceptability and feasibility, barriers, and implementations of change. Items include open ended questions. Responses were for program evaluation and improvement purposes. Additionally, participants were asked about the usability of the online platform and program (see Appendix C, Table 5). Responses on the above measures were used to inform

future intervention development. Areas in need of improvement for future use and dissemination of the intervention were identified.

Data Analysis

A group design was used for this study. Analyses were conducted in SPSS 29. An alpha of 0.05 was used for significance. Cronbach's alphas were used to measure reliability within each scale. Means and standard errors were reported for all scales. Repeated measure ANOVAs with within-subject factor of time and between-subject factor of group were used to examine group and time differences. Paired samples t-Test were used to compare change score within group for significant interactions.

Chapter III

Results

The purpose of this study was to evaluate the efficacy of a self-guided, web-based program targeted at improving participants' overall levels of psychological flexibility. Additionally, this study provided guidance on areas of improvement for future renditions of this program. Intervention group procedures required participants to progress through four modules over four weeks. Each module included 30-45 minutes of content and activities. Waitlist procedures included weekly emails to participants with a mental health tip. Analysis of research questions are described in more detail below.

The pretest for this study received 105 responses. Eight responses were excluded because individuals did not provide contact information, did not consent to participate, or completed the pretest multiple times. A total of 93 participants were eligible to participate. About half (54.8%) were randomly assigned to the intervention group. The remaining were sorted in the WLC group. Of the individuals contacted to enroll in the intervention, 33 participants (64.7%) enrolled. Fewer completed the first module (n = 24). Within the intervention group, 16 completed all four modules.

This study consisted of 93 participants (based on pretest) and 91 participants based on completed pretest and posttest. Participants in the study were from one post-secondary university in the Southeastern United States. Most participants (90%) self-identified as female and straight. Less than 10% reported identifying as male, transgender, or a part of the LGBTQIA+ community. Participants were predominantly enrolled in the College of Education, Health, and Human Sciences. Additional participants reported being in the College of Arts and Sciences, Communication and Information, Advertising and Public Relations, and Music. About 34% of

those who completed the survey and were randomly assigned to the intervention group reported some form of mental health diagnosis.

Research Question One

The first research question assessed whether differences existed in undergraduate students' level of perceived stress (between our two groups) when using a self-guided psychological flexibility intervention versus a waitlist control group who received weekly mental health tips. Cronbach's alpha coefficients were measured for each scale. Results from the reliability tests indicate all scales had Cronbach's alpha scores of 0.80 or higher. All means and standard errors by group and by time for stress are presented in Table 8. No significant interaction of time and group $F(1,52) = 1.45$, $p = 0.23$. The results indicated no significant main effect of group $F(1,52) = 0.80$, $p = 0.38$ and no significant main effect of time $F(1,52) = 0.14$, $p = 0.71$. This effect tells us that the level of perceived stress in the experimental group participants was not significantly different from the level of stress in the waitlist group at either time point. The results indicated no significant interaction effect on well-being F (1, 52) = 3.08, p = 0.09. No main effects for time $F(1,52) = 0.03$, $p = 0.86$ or for group $F(1,52) = 0.03$, $p = 0.86$ were found. This result revealed that ratings of well-being in the experimental group were not statistically significant from ratings of well-being in the waitlist group at either time point.

Research Question Two

The second research question assessed whether differences existed in undergraduate student's level of psychological flexibility when using a self-guided psychological flexibility intervention versus a waitlist control group, as measured by the AAQ-2, CFQ, ELS, MAAS, and PVQ-2. Cronbach's alpha coefficients were measured for each scale. Results from the reliability tests indicate all scales, except for the PVQ-2, had Cronbach's alpha scores of 0.8 or higher. The

PVQ-2 scale had a reliability coefficient of 0.650. Because of this, we did not analyze pretest and posttest data for this scale due to lack of reliability.

All means and standard errors are presented in Table 9. Results indicated no significant interaction effect for acceptance $F(1,52) = 0.67$, $p = 0.42$, no significant main effect for time $F(1,52) = 0.11$, $p = 0.74$ and no significant main effect for group $F(1,52) = 0.03$, $p = 0.86$. Results indicated no significant interaction effect for values $F(1, 52) = 0.17$, $p = 0.68$, no significant main effect for time $F(1,52) = 0.65$, $p = 0.43$, and no significant main effect for group $F(1,52) = 0.69$, $p = 0.41$. Results indicated no significant interaction effect for mindful attention $F(1,52) = 3.11$, $p = 0.08$. No significant main effect for time $F(1,52) = 1.14$, $p = 0.29$ or for group $F(1,52) = 0.89$, $p = 0.35$ were found. These effects suggest that ratings of acceptance, values, and mindful attention in the experimental group were not statistically significant from ratings in the waitlist group. Although results of the ANOVA for the intervention on mindful attention were not significant at the $p = 0.05$ level, the experimental group may have increased in their mindful attention, as there appears to be an increase from pretest to posttest ($M = 3.53$ vs $M = 3.78$). A power analysis t-test was conducted to determine how many individuals in each group would be needed to find significance. Results of the power analysis indicated that in a normal random sample, 64 individuals per group would be needed to determine significant differences. Little to no change was detected among mindful attention between the waitlist pretest and posttest.

A repeated-measures ANOVA showed a significant interaction in cognitive fusion $F(1,52) = 6.44$, $p = 0.014$. To explore this interaction, time points were compared within each group. Within the waitlist control group, there was a statistically significant increase ($p = 0.033$) in CFQ scores from 3.64 to 4.11 between the pretest and posttest. Within the experimental group,

the means showed a slight decrease from 3.76 to 3.54; however, this was not statistically significant ($p = 0.19$). Therefore, we can conclude that the results for the ANOVA indicate a significant increase for waitlist.

Research Question Three

The third research question evaluated whether differences in the impact of the intervention differed based on student stress levels, as measured by PSS. Of the students who completed the pretest, 13 (14.3%) were classified as high stress by their scores on the PSS (M>/= 2.70). Of these participants, 5 were in the experimental group and completed the test at both time points. Therefore, there were not enough highly stressed individuals to determine if the intervention was more effective depending on the level of stress.

Research Question Four

Research question four assessed the difference in attrition rates between those with differing stress and mental health scores, as measured by PSS and MHC-SF. Similar to research question four, too few participants were classified as highly stressed or low mental health in the experimental group and completed both the pre and post-test to answer this question.

Research Question Five

The final research question assessed whether participants found the intervention acceptable. Participants in the experimental group answered intervention access questions and an acceptability questionnaire (see Appendix C for items). Participants in the experimental group were separated by those who completed 3 or more modules and those who completed 2 or less modules. Participants who completed all modules responded that they accessed the intervention by visiting the canvas page nearly once a week. Within this group, time spent thinking about the intervention weekly ranged from between 0-5 minutes to 30+ minutes. When asked about

practicing the skills, most spent between 0- and 20-minutes practicing. Participants most often completed the intervention at coffee shops or where they live.

Participants answered open ended questions regarding several aspects of the intervention. A thematic analysis was used. Participants who engaged with all program content described the online mental health intervention as helpful, interesting, and enlightening. They noted learning strategies to stay grounded, be aware of emotions, and to deal with stress, emotions, and thoughts. Additionally, they reported learning about the link between emotions and behavior, specifically how emotions do not control their actions, and the value in taking breaks. Participants reported finding the most value in learning more about themselves, identifying their values, and completing the defusion exercise of leaves on a stream. Aspects that were regarded as valuable and most liked included the reflections, the passengers on the bus activity, and having time to sit and process their feelings.

All participants who completed one or all modules reported positive responses about the brief nature of this intervention. A few participants who completed all four modules provided more information. The brevity of the intervention allowed participants to take a break from their daily activities, re-center, and focus on their thoughts and feelings. It reportedly made the intervention more compelling to complete. Most participants in the experimental group who completed all four modules reported that they did not skip any pieces of the intervention. One participant, however, reported that he skipped parts of the intervention he felt were repetitive or that he already knew through other platforms. Participants who completed two or less modules reported skipping pieces of the intervention due to forgetfulness, limited free time, and other obligations (e.g., school).

Participants reported various facets of the program they liked least, including type of content, question format, video quality, and time needed. Participants reported disliking the repetitiveness of question and video content. They noted the content was not always relatable. Participants suggested use of real people, students and teachers, more realistic scenes, and more applicable examples. Some respondents felt that the examples were mainly about school, which limited application. Regarding question format, participants reported mixed reviews. Some disliked the quiz style questions following videos. These respondents suggested interactive and reflection type questions. Others disliked the number of reflections included in each module. One respondent stated that it was difficult to write out their feelings. Additional respondents suggested more specific questions, a guide with word definitions, and reminders for the take home activities.

Respondents reported disliking the quality, slow pace, and inconsistent audio within the videos. Specifically, some reported the instructions within the videos felt "targeted to children" or "boring." One respondent in particular reported feeling as though the intensity of the program was too low and not adequately complex for college aged students. Time was an additional complaint. Respondents reported barriers, such as time restrictions within the module (e.g., the week limit), busyness, and not knowing how long each module would take. One respondent suggested the removal of time restrictions (or at least loosening them so participants can turn in late work) would make a big difference.

Other areas that were reported to be difficult included completing breathing exercises, questions about intrusive thoughts, and abstract visualizations. Respondents noted some difficulty with the feelings that came up while completing various activities. They noted having a hard time opening up. In terms of adverse effects, some participants noted that the physicalizing

the thought and closing of modules made them more anxious. One respondent stated that they were unsure when the modules would reopen which made them feel stressed. Most participants noted that they experienced no worsening of their anxiety, depression, or stress while completing module content. These participants reported that the module helped them better address their emotions and impacted them in a positive way. Most respondents indicated they would recommend this intervention to someone they care about or to someone struggling. One participant noted that this would be helpful for incoming college students or those who have never dealt with intense stress. Participants reported the delivery of theoretical ACT concepts and instructions were straightforward. Others felt the intervention was well put together, eye-opening, easy to follow, and applicable to daily life. Those who reported they would not recommend the intervention noted that the intervention felt like homework, the videos were rough quality or not interesting, or they had trouble with the theoretical concepts because they are not imaginative.

Chapter IV

Discussion

Research Question One: Differences in Stress and Well-being

Change scores were used in the analyses to answer research questions. Across all participants, the mean change score as measured by the PSS from pretest to posttest suggested no major differences between improvement in stress between the groups from time 1 to time 2. The mean change score as measured by the MHC-SF from the pretest to posttest decreased slightly in waitlist and increased slightly in experimental. Although no major differences in overall well-being between the waitlist and intervention groups were found, there was some increase for the experimental group. It cannot be determined if the experimental group increased in well-being as a result of the intervention or from something else. A slight decrease, although not significant, was found in the waitlist group well-being score between time points. It is not clear whether this decrease was because the waitlist group average scores from the pretest on the MHC-SF was unnaturally high or because of something else.

The overall sample included a relatively healthy sample of participants. Most participants who responded to the pretest indicated feeling positive mental health 2-3 days to every day per week. It is difficult to increase high well-being scores, especially if participants begin the intervention at moderate to high levels of well-being. The waitlist and experimental group started at different reported levels of well-being, which could account for the decrease in well-being for the waitlist group and the increase in well-being for the experimental group. This finding is important and is addressed in the limitation section. Additionally, only a small number of participants completed the entire experimental program. Therefore, data from a small sample was collected. A larger sample, with more presenting mental health needs, who may have varying

levels of well-being and perceived stress levels, may have yielded different results and potentially significant results.

Results of this study differ from previous researchers' findings. Viskovich and Pakenham (2020) found better and statistically significant results with the YOLO program, reporting improvements in scores of well-being and stress for intervention participants. The researchers posited that positive findings within these constructs were associated with increases in components of ACT (i.e., psychological flexibility, mindful attention, cognitive defusion, acceptance). Life Stories researchers, Gaudiano and colleague (2020), found statistically significant results using two video-based storytelling conditions. Participants who completed each condition demonstrated significant decreases in their depression scores. Small to moderate changes in quality of life were noted. This study differed from the current study because participants were recruited from a clinical population. All participants included had a current or lifetime major depressive disorder, as recognized by the DSM-V. Similar to this project, no significant changes in stress or anxiety were found among the intervention condition in ACT-CL (Levin et al., 2014).

Research Question 2: Differences in Psychological Flexibility

Based on previous research, web-based ACT interventions support improved mental health skills like acceptance, defusion, valued living, and present moment awareness (Viskovich & Pakenham, 2020). Thus, we hypothesized that students in the intervention group would have increased psychological flexibility skills than those in the wait list control (WLC) group. Cognitive fusion scores between groups at time 1 did not differ significantly. However, significant differences were observed for cognitive fusion scores in the WLC group at time 2. Cognitive fusion drifted up in the WLC group, suggesting they became more inflexible over

time. The experimental group did not change significantly between time points. If participants' inflexibility is increasing over time when they are not receiving any form of intervention, this is likely true for individuals within a clinical population who are waiting to begin or restart therapeutic services.

No significant differences were observed for mindful attention. The WLC group experienced little to no change between time points. Although not significant, the experimental group increased in this area. This improvement suggests the intervention may benefit a participant's level of mindful attention. To find significance within a random, normal distributed population, a power analysis suggested that 50 or more participants per group would be needed. A clinical population may have even lower pretest levels of mindful attention. However, most individuals in this study reported a moderate to strong level of mindful attention. Because of this, it is likely that a clinical population may see larger increases in mindful attention because of the intervention.

Acceptance and valued living are primary constructs within the psychological flexibility framework. No significant differences were observed in these constructs between or within the waitlist and experimental groups. Any changes or possible differences were very small. The groups, specifically the WLC group, started on the healthier end of most of the constructs measured, which made finding differences difficult because there was not much room for improvement. The PVQ-2 scale, measuring education, schooling, and personal growth, was excluded from the analysis. Reliability for the measure, even when items were reverse coded and some were dropped, was moderate (< 0.65). Low to moderate reliability may be because it required respondents to think of one specific value. Little reliability data for this measure exists

in current literature. This study attempted to provide reliability data; however, given the results of a reliability test, there is no strong evidence to support this measure.

The researchers of the YOLO program saw improvements within their intervention group in acceptance, defusion, valued living, and present moment awareness. These results were replicated within their WLC group. Significant differences between and within groups for ACT knowledge, depression, education values success, and positive motivation for education were found in ACT-CL (Levin et al., 2014). Small to moderate differences in psychological flexibility were found in association with participation in Life Stories (Gaudiano et al., 2014). These studies acquired larger participant groups with more severity in pretest levels of overall mental health.

Given the results of the study, the intervention was not found effective in increasing most constructs composing psychological flexibility. These results could be due to an issue of dosage incompatibility. It is possible that four modules may not be appropriate for this population of participants. Researchers should continue to examine programs like this to understand if four modules are best or if participants would benefit from fewer or more modules. It could be due to the number of activities. Researchers should continue to include a variety of activities for participants to choose from. Within each construct of psychological flexibility, multiple relevant activities exist. Additional reasons for small effect sizes could also be due to lack of complexity or relatability as reported by participants. Future researchers could evaluate if one activity is more impactful, accepted, or engaging than another, which could potentially help with attrition issues.

Research Question Three: Stress Differences on Impact of Program

Researchers sorted the participants into groups based on their perceived stress score. As mentioned above, this sample is relatively healthy. Too few participants reported high stress

levels, making the evaluation of this question difficult. Upon reviewing the data, 11 participants were above the high perceived stress cut off. Of these participants, researchers sought to determine which of these participants were randomly sorted into the experimental group to receive the intervention and completed the survey at both time points. Four participants met the criteria. The low percentage of participants indicated that the sample did not include enough highly stressed individuals to determine whether the program was more effective for individuals falling into either the highly stressed or not highly stressed groups.

Levin and other researchers (2014) found within group differences for ACT-CL for varying levels of distress. Within distressed students, changes across time were noted with anxiety and depression for those sorted into the ACT-CL condition compared to the waitlist. Distressed students indicated at least minimal symptoms of anxiety, depression, or stress. Decreases in anxiety and depression were not seen in their waitlist condition.

Research Question Four: Well-being Differences on Attrition Rates

This study sought to understand if well-being influences dropout rates among and between program conditions. We hypothesized that attrition rates would be higher for those with more severe and pressing mental health concerns. Individuals who experience mental health issues, especially as students enrolled in university level classes, may have difficulty completing daily life activities (Campbell et al., 2022; Pascoe et al., 2020). Factors that help students achieve success in college, like motivation, engagement, and executive function skills, are also those most impacted by decreasing mental health.

Previous researchers reported that participants categorized as severely distressed completed modules at a similar rate compared to the overall sample (Viskovich & Pakenham, 2020). As examined in research question three, not enough participants reported severe mental

health concerns to answer this question. The sample consisted mostly of participants with little to moderate concerns with mental health. A sample that is both larger and includes more variation in level of mental health concerns may be needed to answer this question.

Research Question Five: Perceptions of Program Effectiveness

Participants reported mostly positive reviews of the program. They felt that the program was helpful, educational, and that they would recommend it to a friend in the future. Although positive reviews were reported, they were qualitative in nature. The proposed study included the use of the System Usability Scale (SUS) to measure social validity. It was planned that this measure would be included in the post-survey to evaluate for ease of navigation, level of complexity, consistent presentation of needed resources, and level of confidence using Canvas. By mistake, the primary researcher and creator of materials excluded this measure from the post-survey. Therefore, no quantitative data exists to analyze the current study's usability. Use of this measure, or one similar, is strongly encouraged for future use of this program.

Many participants reported learning previously unknown skills or content. However, no measure was included to measure acquired knowledge. The program included adaptations from available evidenced-based ACT resources, such as the ACT-CL program and *Mindfulness and Acceptance and Commitment Practices in the School Setting* (Holland & Hawks, 2022; Levin at al., 2014). Researchers may consider measuring gains for ACT knowledge in future renditions of the program, as it may have indicated significant results.

Some module content was not as accepted as others. Few participants reported that within the Defusion module, one exercise titled Physicalizing the Thought, was both challenging and uncomfortable. This module was the second presented module. When considering dropout rates, this discomfort may have impacted the number of participants who completed following module

activities. Noted negative feelings could be due to the asynchronous modality of the exercise. Physicalizing the thought may be more accepted and understood when facilitated and practiced in an in-person setting. Noted discomfort and challenge for this exercise could also be due to the exercise itself. Several participants noted that it felt too abstract. Clearer instructions should be considered if this exercise is used again with this population. Another possible reason this exercise was not as accepted by program participants could be that the education video participants viewed before completing the exercise was not done well. Editing of videos should be considered for future use, and a more thorough review of the education and exercise is encouraged.

Limitations and Future Research

Participants

Like previous studies evaluating similar programs, the sample size consisted of mostly straight, white, female participants (Gaudiano et al., 2020; Levin et al., 2014). Prevalence of mental health concerns are prominent among females. However, males and individuals a part of a minority group with mental health concerns are less likely to seek support. Future research should consider recruitment of more male, minority group individuals as potential participants. Results from their participation in the intervention may differ from previously studied groups (e.g., white, female participants). This research can inform treatment for these groups, especially if they feel the supports available to them are not appropriate.

Sorting Procedures

The sample of respondents to the pre-assessment was randomly divided into two groups using SPSS. One grouping method that was considered included stratifying the sample based on participant's level of stress as indicated by their stress score on the PSS. If this method were

used, scores for the PSS would have been totaled. Responses would have been sorted in descending order. Following this, responses would have been grouped. The value in stratifying the sample is to evenly split an equal number of highly stressed people, moderately stressed people, and little stressed people among the two groups. With this method in use, scores can be compared more easily between the waitlist control (WLC) and intervention groups. Without stratifying the sample based on stress level, it is difficult to know if participants benefited from the intervention more or less than expected. We cannot compare the WLC group and the intervention group without considering this component. Future researchers may consider stratifying the sample based on level of stress as measure by the PSS, or a similar stress scale.

One reason this method was considered but not used is because, like previous researchers, researchers of the current study hypothesized that everyone, regardless of level of stress, can benefit from an intervention targeting flexibility and well-being (Viskovich & Pakenham, 2020). A drawback is that when completing data analyses, stress levels were lower among the randomly sorted WLC group compared to the intervention group. Therefore, the WLC group was a healthier sample, making improvements in well-being and stress more difficult or unlikely. Participants may have less room for growth.

Recruitment procedures

Participants were introduced to the program in the first 10 minutes of a scheduled meeting of a course. A script was read in person and posted as an online announcement as well. No treatment integrity was reported for adherence to the script. Following the announcement, some confusion about when the program would begin, how to access it, and time commitment was noted. The set start date for the program was postponed due to recruitment extension. The pre-assessment, consisting of multiple scales and demographic like questions, was required to be

completed before participants were contacted about enrollment in the program. Several complaints about the time required to complete the pre-assessment were noted.

Individuals recruited for this study attend a public university in the Southeastern United States. This university uses Canvas Academic as their online learning management system. The program evaluated in this current study was created on Canvas Catalog. Canvas Catalog differs from Canvas Academic in that it requires individuals to self-enroll in a course and requires navigation to a Canvas platform that is likely unfamiliar to students. Individuals had difficulty accessing the webpage, even with specific access instructions. A benefit of the program taking place on a course page on Canvas, is that students are familiar with the platform and navigation through categories (i.e., modules, announcements, quizzes, etc.). Although familiarity with the online learning system was expected to be positive aspect of the program, it was a barrier for access. Researchers may consider using video instructions in the recruitment email instead of written instructions. This may help with navigating to and bookmarking the Canvas Catalog course page.

Intervention Procedures

Intervention creation. PowToon is an animation software platform used for video creation and presentations. This platform was used to create all educational, activity, and reflection video presentations for the current study. Videos were downloaded and embedded within the Canvas Catalog Module page. PowToon presented a learning curve for the primary researcher. Video creation was a time-consuming process, often taking several hours to create one 3–6-minute video. The time needed to make each video decreased significantly as more videos were made and could be used as templates. Researchers can consider using PowToon training videos to understand features of the platform. Additionally, the researchers accessed

PowToon through a colleague's business account. The price per year may be a barrier to independent practitioners, as the expense varies depending on the plan. Practitioners may consider using a different platform for video presentation creation that is more practical, affordable, and requires less time.

Participant self-enrollment. Due to the nature of the Canvas Catalog course, students were required to self-enroll in the course. This required a few additional steps for participants to access the course. Even when students self-enrolled appropriately, the number of participants who completed the first module completely was about 50% of those who enrolled successfully. Future researchers may consider a program that does not require participants to self-enroll. Although unclear how much impact self-enrollment had on attrition rates, it required more work from the researchers in providing reminders and seemingly more work for participants. Perhaps some incentives need to be given to participants to do the extra step. Researchers may consider looking at a comparison of results from participant enrolled programs versus researcher enrolled studies. It would be interesting to see if participant led enrollment included participants with lower rates of mental health concerns.

Module Order. The order of the modules for the current study was adapted mainly from the YOLO Program (Viskovich & Pakenham, 2020). Gains in psychological flexibility was reported because of their program. Therefore, this study hypothesized similar results. However, significant improvements were made in cognitive fusion for the waitlist participants. Previous research suggests more gains are present when mindfulness is presented early in programs. Mindful attention was presented as the last module of this program. Future studies may consider altering the order in which modules are presented.

Module Release. Modules were expected to be released on Sunday of each week for four weeks. However, given deadlines of the researchers, the first module was released on a Friday. Therefore, subsequent modules were released on Fridays. Researchers had planned to release the modules Sunday evening before the school week. Sunday was considered because most of the participants in our population would likely be home, completing work or engaging in on their computer. Researchers should consider releasing modules on Sunday to see how results differ from modules released on Friday morning.

Consistency with module completion reminders varied. Reminders went out at variable times on either Wednesday or Thursday of the week. It is hard to determine whether inconsistency with reminders impacted participants engagement and completion of the module content. Participants may have rushed to complete the content or felt like they did not have time to complete and therefore gave up. Future researchers may consider a more consistent reminder schedule to contact participants.

Waitlist control materials. The WLC group did not receive notification that they were a part of the WLC group. Instead, a week and a half after the intervention group received instructions to enroll in the Canvas course, the WLC group received an email with a mental health tip (Appendix D). The email to this group was sent out at 9:00 am on Wednesday morning. They received two additional emails of the following Wednesdays including a new mental health tip. The first two weeks, waitlist participants received steps on how to complete a breathing exercise and a grounding exercise. The third week they received a list of 10 mental health tips for college students. Future researchers may consider making the WLC group materials more streamlined and simpler. For instance, instead of 10 tips, consider providing this group only one tip to use throughout the week.

Intervention Modality

The modality of the program was asynchronous, with no face-to-face contact. The program consisted of premade and preselected activities, used to promote each factor of the ACT framework. At the conclusion of the pilot study for this online program, researchers wondered if the online modality was the most appropriate for the selected population. Given this program was created as a potential resource for college students to use while they face long wait times for a university counseling visit, it was feasible to create and use an online, asynchronous modality. However, if a participant was in crisis or not responding well to the intervention, no clinical judgement was able to be used. Therefore, no intensive or additional intervention efforts could be implemented. Because of the asynchrony, feedback from the participants was not considered in creating the modules. This program did not involve real practice of skills, flexibility in adapting activities, or facilitation of a therapeutic relationship. Although participants were prompted to practice the skills and pause several activity videos, no clinician was available to facilitate or oversee the practice. Because of this, it is hard to conclude that participants practiced appropriately, or at all.

Little flexibility in activities existed within this program. The first module allowed for participants to select between two take home activities to complete. However, this was the only module that included a choice of activity. All other modules included one take home activity. Within modules, participants were encouraged to complete two activities and the take home activity. Based on responses to a few activities, some participants had difficulty getting into the appropriate mindset to complete them. They reported feeling uncertain about the approach to complete them. Had this program been conducted in person, participants would have had the opportunity to voice any uncertainty to the clinician leading the program. An in-person modality

allows for the clinician to adapt activities to the needs of the participant or participants. This flexibility allows participants the opportunity to get the most out of the activity and to practice the skill appropriately. Due to the asynchronous nature of the program, no therapeutic relationship was formed. Participants completed skills individually and reflected on their experience. Many researchers report the most gains in coping skills when there is a strong therapeutic relationship (Garrido et al., 2019). Researchers should consider these limitations with the asynchronous modality of the program.

Researchers can consider pairing participants with a partner to practice skills or to keep one another accountable. This pairing can be completely anonymous, and participants can choose whether they feel comfortable self-disclosing their identity. Participants can use their partner to discuss the activities, practice skills, and remind each other to complete each module. Weekly check ins may be another component future researchers can assess for content understanding and barriers to completion and engagement. Researchers can consider offering more flexibility of choice regarding activities in each module. This is time consuming of the researcher's side who facilitates content creation; however, this process could increase engagement for participants. Participants may find more value in selecting which activity to complete which would offer flexibility to make the program fit individual needs.

Attrition

This intervention, although brief, web-based, and easily accessible, asked participants to commit 30-45 minutes of their time to watch videos and to complete activities and reflections. Many participants may have forgotten to complete the activities, as there was only one initial notice the module was available, and one reminder provided. The day and time of these

announcements varied. Future research could inform best practice for highest engagement when contacting undergraduate students (e.g., time of day, day of week, etc.).

Researchers of the current study hypothesized attrition as an issue based on evaluations of similar programs (Levin et al., 2014; Viskovich & Pakenham, 2020). For this project, researchers were interested in total attrition rates, specifically for this sample of university participants. Over 100 (n = 105) participants completed the pre-assessment, with 99% consenting to participate. Of consenting responses collected, 4% were excluded due to duplicate responses and lack of appropriate contact information. Remaining responses were randomly divided into two groups. Following this, participants were contacted with program enrollment instructions. They received three reminder emails to enroll. Less than 70% of those contacted enrolled in the program. Fewer started the first module and even fewer completed the first module and subsequent modules.

High attrition rates may be due to recruitment procedures. The current study actively recruited participants through class announcements, both in person and online through a learning management system. The YOLO Program was used in university students as well. However, recruitment procedures differed from this current study and relied on interested participants to visit a website to enroll (Viskovich & Pakenham, 2020). Recruitment procedures included posters in university affiliated areas (e.g., student services, medical clinic, etc.), class and Facebook announcements, and university wide email contact. Because their recruitment procedures were university wide, they had a much larger sample, which likely yielded a more diversified sample based on well-being and stress. ACT-CL was used with individuals enrolled in either one of two local universities or the community college (Levin et al., 2014). Students responded to posted flyers and advertisements affiliated with their school. This method of

recruitment differed from the current study. Interested participants self-elected to enroll. They also received $60 financial compensation for participation in the study. Life Stories recruitment procedures included distribution of brochures in various primary care clinics and online advertisements posted on Craigslist and Facebook for the local area (Gaudiano et al., 2020).

Future researchers on this program may consider collaborating with campus counseling centers to use the intervention with more clinical populations. Counseling centers offer services to those actively seeking help. Their client populations may have lower pretest scores for various constructs of psychological flexibility than the random population used in this study. Because of this, researchers would expect a larger impact on a clinical population. Pairing with counseling centers may increase the number of participants who complete the intervention.

Implications

More research is needed on this program before it can be recommended for universities and practitioners to start using it. Findings in cognitive fusion scores and trending findings in mindful attention were noted. Additionally, participant feedback indicated favorable views of the program. This feedback suggests college students are looking for a resource like this and should be available for those who are interested.

The current study showed significant differences in the waitlist groups levels of inflexibility, as measured by cognitive fusion. This indicates that while the experimental group received the intervention and showed no differences in their cognitive fusion scores, those who were sorted into the WLC increased in inflexibility. This finding is important for university counseling centers to consider when they add individuals to their service waitlist. Counseling centers can provide this program or a similar program to combat the negative effects of being on a waitlist when you could benefit from a web-based psychological flexibility program.

Conclusion

This study evaluated the effects of a web-based intervention program designed to promote psychological flexibility in college students. This was a pilot study as the intervention had never been used before. Effects were found in college student cognitive fusion scores. Features of the study, specifically with the quality of videos, need to be addressed before the program may be used in similar populations. Replications of the study are needed in both a random normal sample and a clinical population sample. Results of future studies will help determine if the program is effective among a larger sample. Perhaps end with something positive, such as the potential impact and restate the need for such a program based on lit review.

References

American College Health Association. American College Health Association-National College Health Assessment III: Undergraduate Student Reference Group Data Report Spring 2022. Silver Spring, MD: American College Health Association; 2022.

Bass, C., van Nevel, J., & Swart, J. (2014). A comparison between dialectical behavior therapy, mode deactivation therapy, cognitive behavioral therapy, and acceptance and commitment therapy in the treatment of adolescents. *International Journal of Behavioral Consultation and Therapy, 9*(2), 4-8. https://doi.org/10.1037/h0100991

Biederman, J., Petty, C. R., Spencer, T. J., Woodworth, K. Y., Bhide, P., Zhu, J., & Faraone, S. V. (2012). Examining the nature of the comorbidity between pediatric attention deficit/hyperactivity disorder and post-traumatic stress disorder. *Acta Psychiatrica Scandinavica*, *128*(1), 78-87. https://doi.org/10.1111/acps.12011

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire – II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, *42*, 676–688. Doi: 10.1016/j.beth.2011.03.007

Brown, K.W. & Ryan, R.M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*, 822-848. https://doi.org/10.1037/0022-3514.84.4.822

Brown, L. A., Gaudiano, B. A., & Miller, I. W. (2011). Investigating the similarities and differences between practitioners of second and third wave cognitive-behavioral therapies. *Behavior Modification, 35*(2), 187-200. doi:10.1177/0145445510393730.

Cambridge Dictionary. (n.d.). *Deictic*. DEICTIC | definition in the Cambridge English Dictionary. https://dictionary.cambridge.org/us/dictionary/english/deictic

Campbell, F., Blank, L., Cantrell, A., Baxter, S., Blackmore, C., Dixon, J., & Goyder, E. (2022). Factors that influence mental health of university and college students in the UK: A systematic review. *BMC Public Health, 22*(1778), 1-22. https://doi.org/10.1186/s12889-022-13943-x

Carlson, L. E., & Brown, K. W. (2005). Validation of the Mindful Attention Awareness Scale in a cancer population. *Journal of Psychosomatic Research, 58*, 29-33. doi:10.1016/j.jpsychores.2004.04.366

Cherry, K. M., Hoeven, E. V., Patterson, T. S., & Lumley, M. N. (2021). Defining and measuring "psychological flexibility": A narrative scoping review of diverse flexibility and rigidity constructs and perspectives. *Clinical Psychological Review, 84,* 1-16. https://doi.org/10.1016/j.cpr.2021.101973

Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 386-396. https://doi.org/10.2307/2136404

Crosswell, A. D., & Lockwood, K. G. (2020). Best practices for stress measurement: How to measure psychological stress in health research. *Health Psychology Open, 7*(2). https://doi.org/10.1177/2055102920933072

Czyzowska, N., & Gurba, E. (2022). Enhancing meaning in life and psychological well-being among a European cohort of young adults via a gratitude intervention. *Frontiers in Psychology, 12,* 1-7. Doi: 10.3389/fpsyg.2021.751081

Dunlop, B. W., Scheinberg, K., & Dunlop, A. L. (2013). Ten ways to improve the treatment of depression and anxiety in adults. *Mental Health in Family Medicine, 10,* 175-181.

Edwards. D. J., Rainey, E., Boukouvala, V., Wells, Y., Bennett, P., Tree, J., & Kemp, A. H. (2019). Novel ACT-based eHealth psychoeducational intervention for students with mental distress: a study protocol for a mixed-methodology pilot trial. *BMJ Open, 9*, 1-13. doi:10.1136/bmjopen-2019-029411

Eisenberg, D., Hunt, J., Speer, N., & Zivin, K. (2011). Mental health service utilization among college students in the United States. *The Journal of Nervous and Mental Disease, 199*(5), 301-308. DOI: 10.1097/NMD.0b013e3182175123

Flannery, M. E. (2023). The Mental Health Crisis on college campuses. NEA. https://www.nea.org/nea-today/all-news-articles/mental-health-crisis-college-campuses

Garcia-Zambrano, S., Rehfeldt, R. A., Hertel, I. P., & Boehmert, R. (2019). Effects of deictic framing and defusion on the development as self-as-context in individuals with disabilities. *Journal of Contextual Behavioral Science, 12*, 55-58. https://doi.org/10.1016/j.jcbs.2019.01.007

Garrido, S., Millington, C., Cheers, D., Boydell, K., Schubert, E., Meade, T., & Nguyen, Q. V. (2019). What works and what doesn't work? A systematic review of digital mental health interventions for depression and anxiety in young people. *Frontiers in Psychology, 10*(759), 1-19. https://doi.org/10.3389/fpsyt.2019.00759

Gaudiano, B. A., Davis, C. H., Miller, I. W., & Uebelacker, L. (2020). Pilot randomized controlled trial of a video self-help intervention for depression based on acceptance and commitment therapy: Feasibility and acceptability. *Clinical Psychology & Psychotherapy, 27*(3), 396-407. DOI: 10.1002/cpp.2436

Gillanders, D. T., Bolderston, H., Bond, F. W., Dempster, M., Flaxman, P. E., Campbell, L., Kerr, S., Tansey, L., Noel, P., Ferenbach, C., Masley, S., Roach, L., Lloyd, J., May, L.,

Clarke, S., & Remington, B. (2014). The development and initial validation of the Cognitive Fusion Questionnaire. *Behavior Therapy, 45*, 83-101.

Gilmour, H. (2014). Positive mental health and mental illness. *Health Reports, 25*(9), 3-9.

Greco, L. A., Lambert, W., & Baer, R. A. (2008). Psychological inflexibility in childhood and adolescence: Development and evaluation of the avoidance and fusion questionnaire for youth. *Psychological Assessment, 20*(2), 93-102. DOI: 10.1037/1040-3590.20.2.93

Harrer, M., Adam, S. H., Baumeister, H., Cuijpers, P., Karyotaki, E., Auerbach, R. P., Kessler, R. C., Bruffaerts, R., Berking, M., & Ebert, D. D. (2018). Internet interventions for mental health in university students: A systematic review and meta-analysis. *Int J Methods Psychiatr Res., 28*(2). Doi: 10.1002/mpr.1759

Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy, 35*, 639-665.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model processes and outcomes. *Psychology Faculty Publications,* Paper 101. https://scholarworks.gsu.edu/psych_facpub/101

Holland, M. & Hawks, J. (2022). Mindfulness and acceptance and commitment practices in the school setting. Routledge.

Javed, A., Lee, C., Zakaria, H., Buenaventura, R. D., Cetkovich-Bakmas, M., Duailibi, K., Ng, B., Ramy, H., Saha, G., Arifeen, S., Elorza, P. M., Ratnasingham, P., & Azeem, M. W. (2021). Reducing the stigma of mental health disorders with a focus on low- and middle-income countries. *Asian Journal of Psychiatry, 58*, 1-8. https://doi.org/10.1016/j.ajp.2021.102601

Kamenov, K., Twomey, C., Cabello, M., Prina, A. M., & Ayuso Mateos, J. L. (2017). The efficacy of psychotherapy, pharmacotherapy and their combination on functioning and quality of life in depression: A meta-analysis. *Psychological Medicine, 47,* 414-425. doi:10.1017/S0033291716002774

Kanter, J. W., Busch, A. M., Weeks, C. E., & Landes, S. J. (2008). The nature of clinical depression: Symptoms, syndromes, and behavior analysis. *The Behavior Analyst, 31*(1), 1-21. Doi: 10.1007/BF03392158

Kashdan, T. B., Disaboto, D. J., Goodman, F. R., Doorley, J. D., & McKnight, P. E. (2020). Understanding psychological flexibility: A multimethod exploration of pursuing values goals despite the presence of distress. *Psychological Assessment, 32*(9), 829-850. http://dx.doi.org/10.1037/pas0000834

Killingsworth, M. A. (2021). Experienced well-being rises with income, even above $75,000 per year. *PNAS, 118*(4). https://doi.org/10.1073/pnas.20169118

Lattie, E. G., Adkins, E. C., Winquist, N., Stiles-Shields, C., Wafford, Q. E., & Graham, A. K. (2019). Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students: Systematic review. *Journal of Medical Internet Research, 21*(7). Doi: 10.2196/12869

Levin, M. E., Pistorello, J., Seeley, J. R., & Hayes, S. C. (2014). Web-based self-help for preventing mental health problems in universities: Comparing acceptance and commitment training to mental health education. *Journal of Clinical Psychology, 72*(3), 207-225. DOI: 10.1002/jclp.22254

Levin, M. E., Hayes, S. C., Pistorello, J., & Seeley, J. R. (2016). Feasibility of a prototype web-based acceptance and commitment therapy prevention program for college students.

Journal of American College Health, 62(1), 20-30, https://doi.org/10.1080/07448481.2013.843533

McEnteggart, C. (2018). A brief tutorial on acceptance and commitment therapy as seen through the lens of derived stimulus relations. *Perspectives on Behavior Science, 41*, 215-227. https://doi.org/10.1007/s40614-018-0149-6

Mongelli, F., Georgakopoulos, P., & Pato, M. T. (2020). Challenges and opportunities to meet the mental health needs of underserved and disenfranchised populations in the United States. *Focus Lifelong Learning in Psychiatry, 18*(1), 16-24. DOI: 10.1176/appi.focus.20190028

Murthy, V. E., Villatte, M., & McHugh, L. (2019). Investigating the effect of conditional vs hierarchical framing on motivation. *Learning and Motivation, 65*, 33-42. https://doi.org/10.1016/j.lmot.2018.11.002

Parcesepe, A. M., & Cabassa, L. J. (2013). Public stigma of mental illness in the United States: A systematic literature review. *Adm Policy Ment Health, 40*(5), 1-22. doi:10.1007/s10488-012-0430-z.

Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth, 25*(1), 104-112, DOI: 10.1080/02673843.2019.1596823

Radfar, A., Ferreira, M. M., Sosa, J. P., & Filip, I. (2021). Emergent crisis of COVID-19 pandemic: Mental health challenges and opportunities. *Frontiers in Psychiatry, 12*, 1-6. https://doi.org/10.3389/fpsyt.2021.631008

Ruggeri, K., Garcia-Garzon, E., Maguire, A., Matz, S., & Huppert, F. A. (2020). Well-being is more than happiness and life satisfaction: A multidimensional analysis of 21 countries.

Health and Quality of Life Outcomes, 18, 192, 1-16. https://doi.org/10.1186/s12955-020-01423-y

Simon, E., & Verboon, P. (2016). Psychological inflexibility and child anxiety. *Journal of Child Family Studies, 25*, 3565-3573. DOI 10.1007/s10826-016-0522-6

Souza Pinto, A. C., Tavares Luna, I. T., Araújo Silva, A., Costa Pinheiro, P. N., Batista Braga, V. A., Souza, A. M. A. (2014). Risk factors associated with mental health issues in adolescents: An integrative review. *Rev Esc Enferm USP, 4*8(3). 552-561. www.ee.usp.br/reeusp/

Stavropoulos, K. M., Bolouian, Y., & Blacher, J. (2018). Differential diagnosis of autism spectrum disorder and post-traumatic stress disorder: Two clinical cases. *Journal of Clinical Medicine, 7*(4), 71-82. https://doi.org/10.3390/jcm7040071

Strohle, A., Gensichen, J., & Domschke, K. (2018). The diagnosis and treatment of anxiety disorders. *Deutches Arzteblatt International, 115*, 611-620. DOI: 10.3238/arztebl.2018.0611

Suldo, S. M., & Shaffer, E. J. (2008). Looking beyond psychopathology: The dual-factor model of mental health in youth. *School Psychology Review, 37*(1), 52-68. DOI: 10.1080/02796015.2008.12087908

Trompetter, H. R., Klooster, P. M., Schreurs, K. M. G., Fledderus, M., Westerhof, G. J., & Bohlmeijer, E. T. (2013). Measuring values and committed action with the Engaged Living Scale (ELS): Psychometric evaluation in a nonclinical sample and a chronic pain sample. *Psychological Assessment, 25*(4), 1235-1246.

VanderWeele, T. J. (2017). On the promotion of human flourishing. *PNAS, 114*(31), 8148-8156.

Viskovich, S., Fowler, J. A., & Pakenham, K. I. (2023). Fluctuations in mental health in students accessing a university-wide online mental health promotion intervention before and during the COVID-19 pandemic. *Australian Psychologist, 58*(5), 373-387. https://doi.org/10.1080/00050067.2023.2212150

Viskovich, S. & Pakenham, K. I. (2020). Randomized controlled trial of a web-based Acceptance and Commitment Therapy (ACT) program to promote mental health in university students. *Journal of Clinical Psychology, 76*(6), Doi: 10.1002/jclp.22848.

Viskovich, S. & Pakenham, K. I. (2018). Pilot evaluation of a web-based acceptance and commitment therapy program to promote mental health skills in university students. *Journal of Clinical Psychology, 74*, 2047-2069. DOI: 10.1002/jclp.22656

Viskovich, S., Pakenham, K. I., & Fowler, J. A. (2021). A mixed-methods evaluation of experiential intervention exercises for values and committed action from an Acceptance and Commitment Therapy (ACT) mental health promotion program for university students. *Journal of Contextual Behavioral Science, 22*, 108-118. https://doi.org/10.1016/j.jcbs.2021.10.001

Watkins, D. C., Hunt, J. B., & Eisenberg, D. (2011). Increased demand for mental health services on college campuses: Perspectives from administrators. *Qualitative Social Work, 11*(3), 319-337. DOI: 10.1177/1473325011401468

Winkler, P., Formanek, T., Mlada, K., Kagstrom, A., Mohrova, Z., Mohr, P., & Csemy, L. (2020). Increase in prevalence of current mental disorders in the context of COVID-19: Analysis of repeated nationwide cross-sectional surveys. *Epidemiology and Psychiatric Sciences, 29*(173), 1–8. https://doi.org/10.1017/S2045796020000888

Appendices

Appendix A

Definitions and Timeline

Definitions

AAQ-2: Acceptance and Action Questionnaire, 2

CFQ: Cognitive Fusion Questionnaire

ELS: Engaged Living Scale

FS: Flourishing Scale

MAAS: Mindful Attention and Awareness Scale

MHC-SF: Mental Health Continuum, Short Form

PSS: Perceived Stress Scale

PVQ-2: Personal Values Questionnaire, 2

Timeline:

Recruitment and pre survey/assessment: 1/29 - 2/15

Grouping of participants into group 0 and group 1: 2/16

Participants contacted for enrollment: 2/16

Module 1: 2/16 - 1/23

Module 2: 2/23 - 3/1

Module 3: 3/1 - 3/8

Module 4: 3/8 - 3/15

Module extension: 3/16 - 3/21

Post survey/assessment: 3/22 - 3/29

Appendix B

Intervention Recruitment Announcement

"Hi, I'm_____, a graduate student in School Psychology. I'm here to invite you to participate in a research study we are working on to evaluate a web-based program designed for college students**.** The program includes information and activities which are used *to* help you develop skills to manage stress, demands, and challenging circumstances associated with life and with school. There are four modules you will complete, each with 3 short 5 to 15-minute activities. Your total time commitment will be about 30-45 minutes per week for four weeks. If you'd like to participate, you will indicate so in the included link: [insert link]. Once completed, you will be sent more information via email. There are 3 parts once you click the link: the consent form, the assessment itself (which is a few pages), and instructions for accessing the program. Please read the consent form carefully as it describes any potential risks and/or benefits that you may have as a participant in this study. You will complete this assessment before and after completing the program. You will need 20 minutes to complete each assessment. There are no penalties for not participating. Your completion of this study will be compensated with extra points determined by your course instructor. You will be able to earn points as your progress through the program. Thank you for your help with this study, and if you have any questions about the study, please contact the study PI, Merilee McCurdy at mccurdy2@utk.edu or Danielle Shine at dshine@vols.utk.edu."

Appendix C

Tables and Figures

Table 1

Demographics Collected

Age	18, 19, 20, 21, 22, 23, >23
Gender Identity	Male, Female, Transgender, None of these
Sexual Orientation	Gay or lesbian Straight, that is not gay or lesbian Bisexual Something else I don't know/Prefer not to say
Race (select all that apply?)	White Black or African American American Indian or Alaska Native Asian Native Hawaiian or Other Pacific Islander Some Other Race
Educational Year	Freshman Sophomore Junior Senior Something else: write in
State of Permanent Residence	Write in
College Affiliation	Write in
GPA	Write in
Employment	Full time Part Time Neither Something else: Write in
Prior Mental Health Diagnoses	Write in (sensitive information)
Contact with a Mental Health Professional	Yes OR No
Skip Logic: is YES to above, indicate length of total contact	

Table 2

Intervention (Mindful ACTion)

Module	Activities
Values and Committed Action	Introduction to the intervention Introduction to prevalence data, ACT, and doubts Activity: Values Clarification exercise Activity and Reflection: Eightieth birthday speech Homework: SMART goal setting or Roadmap to success
Cognitive Defusion	Review Module 1 Introduction to cognitive Defusion Activity and Reflection: Leaves on a stream Activity and Reflection: Physicalizing the thought Homework: "I am" Labels
Acceptance	Review Module 2 Introduction to Acceptance Activity and Reflection: Passengers on the Bus Activity and Reflection: Chinese Finger Trap Homework: Drop Anchor
Mindfulness and Self as Observer	Review Module 3 Introduction to Present moment awareness and Self as Context Activity: Breathing exercise Activity: Self-Compassion exercise Reflection: practice of mindfulness in daily life

Table 3

Comparison of Web-Based Intervention Module Content

Program	Module Content			
	Values	**Defusion**	**Acceptance**	**Mindfulness**
YOLO	1) Definition of values video, 2) Troubleshooting video, 3) Experiential avoidance video	1) Thought evolution introductory video, 2) Defusing from thoughts video, 3) Defusion video	1) Definition of acceptance, 2) Willingness video, 3) Unwanted party guest metaphor	1) Mindfulness education, 2) Presence video, 3) Observing self-video
A bite of ACT	1) Welcome and instructions journal, 2) brief overview of the purpose of the program and the content of each session journal, 3) Basic ACT tenets video, 4) Painful thoughts and memories and getting caught up in the struggle video	1) Defusion (holding self-stories lightly) video	1) What is acceptance (openness) video, 2) Acceptance as opposed to avoidance.	1) What is mindfulness and how is it useful video, 2) Embedding mindfulness into daily activities video, 3) Passengers on the bus video
ACT on college life	1) Values as direction, reading on types of goals, 2) lesson summary		1) Review of session 1, 2) Explore internal barriers, 3) Control strategy problems, 4) Willingness practice	
Life stories	1) Clarifying one's own values and setting personal goals related to these values;	1) Cultivating awareness of the transient nature of mood experiences and the benefit of trying out various strategies	1) Developing an accepting and nonjudgmental stance towards difficult thoughts and feelings, 2) practicing self-compassion	1) Living more mindfully in the present moment, 2) Advice regarding finding professional help for depression

Table 4

Comparison of Web-Based Intervention Module Elements

Program	Elements	
	Reflection Prompt	**Specific activities etc.**
YOLO	Values: 1) Choose a value you identified in this exercise that you wish to start expressing in your life, 2) Identify the "why" behind this value and find one small action to express it Defusion: Reminder to listen to what your mind is saying, create distance and use the "I notice I'm having the thought" strategy Acceptance: Quicksand metaphor Mindfulness: Do one activity mindfully today	Values: 1) 80-year-old birthday speech, 2) Values Drop, 3) SMART goal Defusion: 1) leaves on a stream, 2) What thoughts hook you, 3) hands as thoughts. Acceptance: 1) Passengers on the bus, 2) Struggle switch, 3) Costs of avoidance and SPACE Mindfulness: 1) formal and informal mindfulness task, 2) classroom metaphor, 3) relaxation observation
A bite of ACT	Values and committed action: Reflect on what went well and no so well in the journal. Defusion: Reflect on what went well and not so well in the journal. Acceptance: Reflect on what went well and not so well in the journal. Mindfulness: Reflect on what went well and not so well	Values: 1) What are values and why are they important? 2) Values clarification including on what went well and not so well in the journal Defusion/Acceptance: 1) Acceptance and openness to thoughts exercise, 2) Leaves on a stream, Self-Compassion: Loving kindness, Mindfulness: 9-minute focused breathing exercise.
Act on college life	Values: 1) "Writing your headline" journal Acceptance: 1) Explore reasons to choose willingness	Values: 1) Values card sorting exercise, 2) SMART and BRAVE goals quiz, 3) goal setting worksheet Acceptance: 1) Homework check in, 2) Values bulls eye, 3) Passengers on the bus, 4) Pain vs suffering
Life stories		Workbook, which included pictures, notable quotes from the storytellers featured in the series, and activities

Table 5

Intervention Access Questions

Item	Response
How often did you access (visit the canvas page) the intervention?	Daily, every other day, once a week, etc.
How much time did you spend thinking about the module during the week?	In minutes: 0-5, 6-10, 11-15, 16-20, 21-25, 26-30, 30+
How much time did you spend practicing the skills learned outside of the modules?	In minutes: 0-5, 6-10, 11-15, 16-20, 21-25, 26-30, 30+
Did you skip pieces of the intervention? Why?	Explain
What did you think about the materials within the intervention?	Explain
Would you change anything? Add anything? Why?	Explain
What locations did you complete the intervention in? Select all that apply.	Coffee shop Dorm/apartment Library Other campus building Other:

Table 6

The Acceptability Questionnaire

Dimension	Item
Acceptability and feasibility:	How would you describe your experience of taking part in the online mental health program?
Brevity and accessibility of intervention:	Did you appreciate that this was a brief intervention?
Process of change:	What did you learn from this program?
Acceptability:	What was the aspect of the program that you liked the most? What was your favorite activity (or session)?
Suggestions for further improvement:	What did you least like about the program? What do you think could be improved?
Barriers:	Were there any difficulties in taking part?
Implementing change:	Do you practice mindfulness, acceptance, Defusion and values? How often? Could you apply what you have learnt through the intervention to the real world in everyday events? Will you apply this new knowledge to everyday events?
Process of change:	Have you noticed any differences in your life as a result of taking part in the online mental health program', what are these differences?
Acceptability:	Would you recommend this intervention to someone you care about? Did you like the theoretical concepts central to the ACT intervention? How did you feel about its delivery?
Processes of the trial:	Was there anything you liked or disliked about the study trial? How could we improve this study trial? Were all the instructions clear?
Adverse effects:	Did you feel that any aspect of the intervention may have made worse any aspect of your anxiety, depression, or stress? Were there any adverse effects that you can recognize due to the intervention?

Table 7

Demographic Characteristics at Baseline

Baseline Characteristic	Full Sample	
	n	%
Gender		
Female	84	92.3
Male	2	2.2
Transgender	4	2.6
None of these	1	1.1
Sexual Orientation		
Gay or lesbian	2	2.2
Straight	84	92.3
Bisexual	4	4.4
Something else	1	1.1
Race		
White	86	94.5
Black or African American	2	2.2
American Indian or Alaska Native	1	1.1
Asian	1	1.1
Some Other Race	1	1.1
Educational Year		
Freshman	38	41.8
Sophomore	23	25.3
Junior	20	22.0
Senior	8	8.8
Other	2	2.2
Contact with Mental Health Practitioner		
Yes, currently receiving treatment	15	16.5
Yes, history of receiving treatment	20	22.0
No	56	61.5

Table 8

Means and Standard Errors of Scales Measuring Stress and Well-being

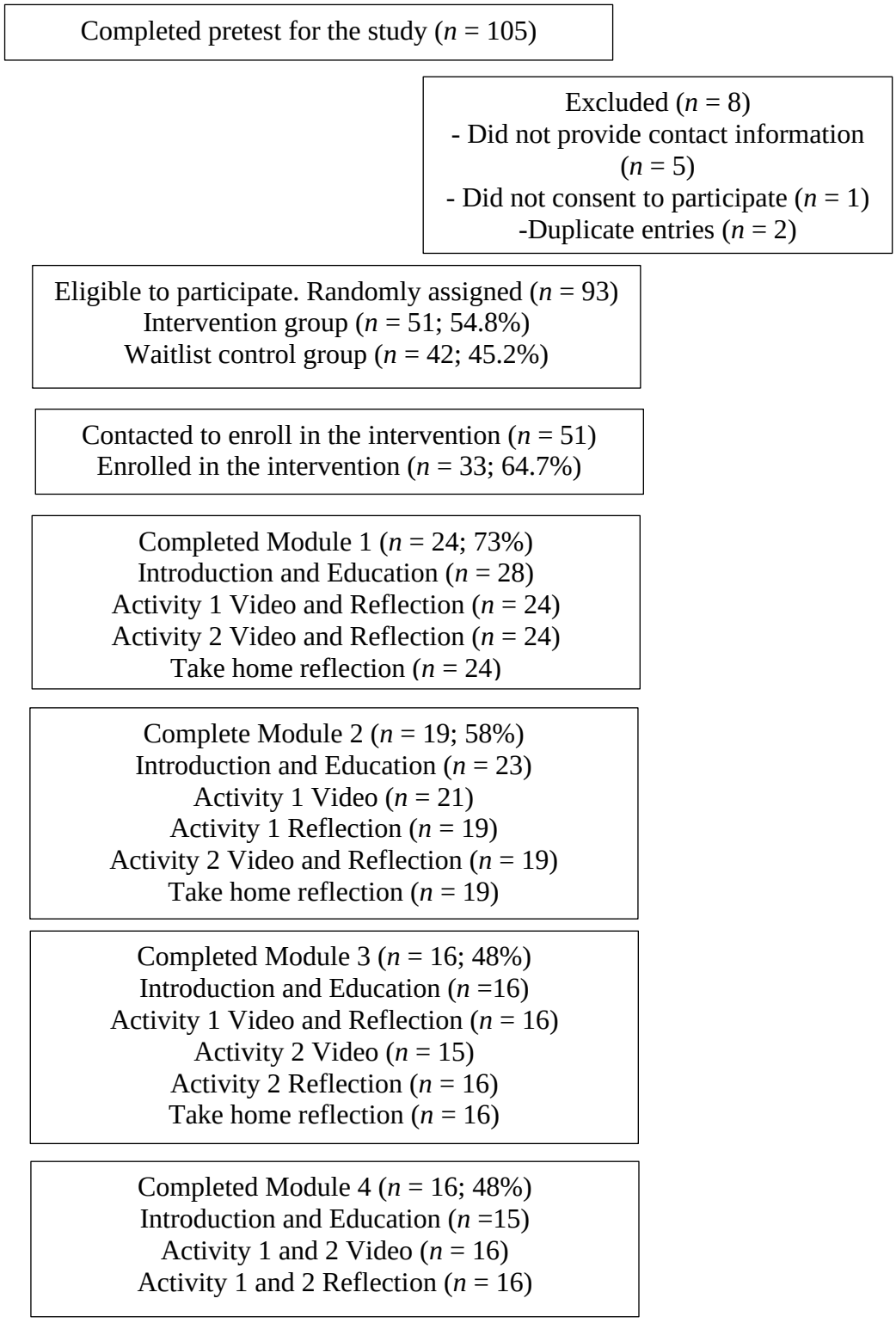
Measure	Experimental				Waitlist			
	pre		*post*		*pre*		*post*	
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
Stress	1.997	0.102	1.947	0.097	2.060	0.133	2.155	0.126
Well-being	4.311	0.171	4.460	0.178	4.496	0.224	4.375	0.233

Table 9

Means and Standard Errors of Scales Measuring Psychological Flexibility

Measure	Experimental				Waitlist			
	pre		*post*		*pre*		*post*	
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
Acceptance	3.244	0.222	3.181	0.226	3.200	0.290	3.350	0.295
Fusion	3.761	0.229	3.542	0.240	3.643	0.299	4.114	0.313
Mindful Attention	3.515	0.158	3.777	0.159	3.450	0.206	3.386	0.207
Values	3.873	0.110	3.844	0.114	4.044	0.143	3.953	0.149
Stress	1.997	0.102	1.947	0.097	2.060	0.133	2.155	0.126
Well-Being	4.311	0.171	4.460	0.178	4.496	0.224	4.375	0.233

Figure 1



Flow diagram of participants

Appendix D
Waitlist Group Resources

Take Ten Breaths (Harris, 2009).
This is a simple exercise to center yourself and connect with your environment. Practice it throughout the day, especially any time you find yourself getting caught up in your thoughts and feelings.

1. Take ten slow, deep breaths. Focus on breathing out as slowly as possible until the lungs are completely empty--then allow them to refill by themselves.
2. Notice the sensations of your lungs emptying.
3. See if you can let your thoughts come and go.
4. Expand your awareness: notice your breathing and your body.

Notice Five Things (Harris, 2009).
This is another simple exercise to center yourself and engage with your environment. Practice it throughout the day, especially any time you find yourself getting caught up in your thoughts and feelings.

1. Pause for a moment.
2. Look around and notice five things that you can see.
3. Listen carefully and notice five things you can hear.
4. Notice five things that you can feel in contact with your body (e.g., your watch on your wrist, your back against the chair, wind against your face).
5. Finally, do all of the above simultaneously.

From: https://www.rtor.org/2022/10/03/10-things-college-students-can-do-to-help-their-mental-health/

10 things college students can do to help their mental health.

1. Get enough sleep.
2. Eat a healthy diet.
3. Exercise.
4. Take breaks.
5. Connect with others.
6. Seek professional help.
7. Try meditation and breathing exercises.
8. Go for a walk.
9. Talk to someone you trust.
10. Try mindfulness practices.

Vita

Originally from Florida, Danielle Shine grew up in Tallahassee, Florida. After high school, she attended the University of Florida and received a Bachelor of Science degree in Family, Youth, and Community Services. Before graduating with her undergraduate degree, she completed an honors thesis under the supervision of a licensed school psychologist. She chose to attend the University of Tennessee, Knoxville to pursue a Doctor of Philosophy degree in School Psychology. Her research interest includes studying the impact of Acceptance and Commitment Therapy of college aged students. After graduation, she will complete a one-year internship at Florida State University Multidisciplinary Evaluation Clinic. Following this, Danielle hopes to pursue work in a clinical setting. She is incredibly grateful for all the support from her family and friends as she begins her new career.