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**A VALUES-BASED SELF-MANAGEMENT PROGRAM FOR UNDERGRADUATE
STUDENTS WITH REMOTE DELIVERY: LOOKING AT EMOTION
REGULATION**

A Master's Thesis

Presented to

The Graduate College of
Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree
Master of Science, Clinical Psychology

By

Sara Elizabeth Johnson

July 2021

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A VALUES-BASED SELF-MANAGEMENT PROGRAM FOR UNDERGRADUATE STUDENTS WITH REMOTE DELIVERY: LOOKING AT EMOTION REGULATION

Clinical Psychology

Missouri State University, July 2021

Master of Science

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ABSTRACT

College students face significant levels of stress (American College Health Association, 2019) and recent data suggests a high prevalence of diagnostic-level mental health concerns being reported by students and treated by mental health professionals (Blanco et al., 2008). College counseling centers are thus facing an increase in demand for services, creating a growing need for innovative treatment options to flexibly accommodate the demand (Center for Collegiate Mental Health, 2016). In response to the unique needs of college students, Acceptance and Commitment Therapy (ACT)-based interventions have received support for their use in increasing wellbeing in engineering students and graduate students (Abiadbe & Moliski, 2020; Paliliunas et al., 2018). In an effort to continue promoting student wellbeing, the present study combined ACT-based therapeutic techniques, self-management strategies, and mindfulness to help undergraduate students progress toward a personally-defined behavioral goal in an area of interest and relevance to them. Three undergraduate students at a midwestern university recruited via their academic department participated by completing an intake meeting, a values and goal setting meeting, and four ACT-based sessions. Self-report measures of psychological flexibility, emotion regulation, values-behavior coherence, self-regulation, stress, and college student wellbeing were administered on the day of the intake session prior to intervention implementation and again on the day of the final session. Between sessions, participants recorded self-monitoring data and answered three self-report items of values-behavior coherence, emotion regulation, and stress via a mobile application. Overall, participants achieved behavior change in the desired directions of their defined goals for the study. Additionally, self-reported levels of psychological flexibility, emotion regulation, college student subjective wellbeing, stress, and values behavior coherence changed in the therapeutic direction. Participants rated their overall experience with this intervention as positive and it was feasible for the researchers to implement. This study demonstrated the utility of a brief, values-based self-management intervention to increase overall wellbeing in undergraduate students. Implications include potential advancements to existing mental health and counseling services for college students.

KEYWORDS: acceptance and commitment therapy, self-management, college student wellbeing, mental health, values

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July 2021

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In the interest of academic freedom and the principle of free speech, approval of this thesis indicates the format is acceptable and meets the academic criteria for the discipline as determined by the faculty that constitute the thesis committee. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees.

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INTRODUCTION

According to the American College Health Association (ACHA), college students experience high levels of stress and mental health difficulties (2019). Stressors common to college students include changes in sleeping habits, vacations/breaks, changes in eating habits, new responsibilities, and increases in class workloads (Ross et al., 1999). Additionally, Ross et al. reported that daily hassles (e.g., waiting in long lines, roommate conflicts), as opposed to major life events (e.g., starting college, parents' divorce), accounted for approximately 80% of all sources of stress.

In addition to high rates of stress, many college students are experiencing the initial onset of diagnostic-level psychiatric concerns. Using the National Comorbidity Survey Replication, Kessler et al. (2005) estimated that three fourths of all lifetime psychiatric diagnoses had initial onset by age 24, and Blanco et al. (2008) estimated the past-year prevalence of any psychiatric condition is 46% among college students. However, only 17% of students reported ever having utilized their university's counseling or mental health services, and only 34% reported ever having received mental health care from a counselor, therapist, or psychologist (ACHA, 2019). Additionally, according to the ACHA, in 2019, 44.8% of undergraduate students reported experiencing "more than average stress," 53% reported academics being "traumatic or very difficult to handle," 25% reported feeling "very sad," and 22% reported feeling "overwhelming anxiety" in the past twelve months. Further, approximately 8% of students seriously considered suicide and 1.4% attempted suicide in the past twelve months. Though this survey data was collected relatively recently, the ACHA's 2017 report presented similar statistics. With all of these statistics taken into consideration, a wide gap exists between

the number of students experiencing mental health concerns and the number of students seeking and receiving adequate mental health treatment.

College-attending young adults and non-college-attending young adults have similar rates of mental health treatment utilization (Blanco, 2008). There are many ways to attempt to explain this statistic. However, when it is considered that college students typically have access to free or subsidized mental health services through their university, it can seem perplexing that more college students do not receive treatment. Some reasons reported for the discrepancy between the number of college students with mental health difficulties and the number of students receiving treatment are stigma, thinking one can manage their mental health concerns without professional help, or believing one's mental health concerns were not severe enough to necessitate treatment. Cadigan et al., (2018) highlight the need for innovative ways to encourage students to seek counseling. However, it could also be the case the need exists for the development of innovative treatment approaches to address experiences and challenges relevant to college students, in addition to continuing to offer traditional talk therapy.

Despite the existence of a gap between the number of college students who may benefit from mental health services and the number of college students who actually receive services, college counseling centers are also sometimes faced with unmanageable student demand. As cited by the Center for Collegiate Mental Health (2016), the use of college counseling center services increased by 30 to 40% between 2009 and 2015, which is disproportionate to the 5% student enrollment increase during the same time period. As clinicians at college counseling centers are facing growing workloads, and students at universities are facing longer wait times for services, the necessity for innovative treatment solutions is evident.

LITERATURE REVIEW

Emotion Regulation

According to Gross (1998), emotion regulation is “the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (p. 75). The psychological process of emotion regulation differs among all individuals with regard to how they tend to respond to emotions, which is likely influenced by biological, psychological, and social factors unique to the individual.

People attempt to regulate their emotions in various ways, and evidence suggests the utility of specific emotion regulation strategies is dependent upon the situation. example, Gross (2002) investigated the affective, cognitive, and social impacts of two common methods of emotion regulation, suppression and reappraisal. The results suggest reappraisal to result in more positive outcomes than suppression across all three domains of interest both inside and outside of a laboratory setting. With regard to affect, increased suppression of negative emotion leads to increased experience of negative emotion. However, the same is not true for positive emotion; when individuals engage in suppression of positive emotions, they are less likely to experience positive emotions. Contrary to suppression, reappraisal was associated with greater experience and expression of positive emotion and lesser experience and expression of negative emotion. Next, with regard to cognition, suppression was found to negatively impact memory, as the suppression process requires continual effort toward monitoring oneself and regulating one’s behavior throughout the experience of the emotion. Reappraisal, however, had no impact of memory ability. Lastly, suppression had poorer social outcomes when compared to reappraisal and a control condition. Specifically, it was more physiological arousing for an individual to

interact with someone else who was engaging in suppression and less responsive to emotional cues than it was to interact with someone engaging in reappraisal or someone who was not instructed to use an emotion regulation strategy. Those who did not utilize suppression showed more positive emotion and increased responsiveness to emotions. On an individual level, individuals who utilize suppression regularly as a means to emotion regulation were less likely to self-report sharing positive or negative emotions with others and using emotional social support as a coping mechanism. Additionally, individual reports suggest they tend to like others better who do not use suppression of emotions. This study highlights the differential utility of two mechanisms of emotion regulation, suggesting there are more and less helpful ways of managing one's emotions. However, the more helpful means of regulation may not be intuitive to all individuals.

Emotion Dysregulation. It is widely accepted that emotion dysregulation is related to psychopathology. D'Agostino and colleagues (2017) attempted to define "emotion dysregulation" given the widespread use of the term and interest in the topic but no agreed upon conceptual definition. In a review of 123 articles, they identified five core and overlapping components of emotion dysregulation, including, 1) decreased emotional awareness, 2) inadequate emotional reactivity, 3) intense experience and expression of emotions, 4) emotional rigidity, and 5) cognitive reappraisal difficulties. Despite their identification of the aforementioned components of emotion dysregulation, the authors encourage future researchers to continue delineating the process of emotion dysregulation, whether it helps cause psychopathology or is a result of psychopathology, and how to measure it more accurately.

According to Linehan's biosocial model of stress (1993), individuals have different emotional reactions due to innate biological differences and unique environmental influences. By

definition of her theory, emotionally dysregulated people have three distinct characteristics. First, they experience greater sensitivity to emotional stimuli. Second, they have a lesser ability to regulate intense emotions than people with adequate emotion regulation capability. Third, they take a longer than average time to return to a baseline state of emotion. Linehan's biosocial model was primarily conceptualized with regard to Borderline Personality Disorder (BPD), however, emotion dysregulation is not unique to individuals who meet the diagnostic criteria for BPD.

Emotion Dysregulation in College Students. Emotion dysregulation is common to both clinical and nonclinical samples of college students. In a sample of undergraduate students, Prosek et al. (2018) found that those who used illicit substances experienced more stress and anxiety than nonusers. They propose illicit drug use may be a means of emotion regulation, relieving anxiety and stress, for some students. This relationship between substance use and negative mood states could lead to potentially harmful substance-related pathology in college students, indicating a need for intervention. Similarly, in a study of college women, emotion dysregulation predicted motives for drinking as a coping mechanism, which was predictive of heavy alcohol use and related negative consequences (Messman-Moore & Ward, 2014). They suggest that college women may drink in order to cope with overwhelming negative emotions and that college-aged women may benefit from interventions targeting emotion regulation difficulties to decrease their risky drinking behaviors. Another study found that "disordered" (i.e., excessive) social media consumption was associated with college students' desire to drink alcohol to cope with negative emotions (Hormes, 2016). The authors propose their findings to be consistent with the results of Hormes et al. (2014) stating that excessive social media is associated with poorer emotion regulation ability.

Further, emotion dysregulation is related to many forms of psychopathology, and the rate at which college students are experiencing mental health problems is high, thus there are many college students for whom an intervention targeted to increase emotion regulation may be beneficial. Specifically, at the time of data collection for the American College Health Association's 2019 National College Health Assessment, many students reported being diagnosed with or treated for a number of mental health conditions by a professional within the past twelve months (24.3% anxiety; 20.0% depression; 1.6% substance use disorders; 6.7% Attention-Deficit Hyperactivity Disorder). All of the aforementioned mental health conditions include emotion dysregulation as a common feature of the disorder (Dvir et al., 2014). Additionally, Meaney et al. (2016) estimate the prevalence of BPD in college students to be around 9.7%, adding to the overall number of students who may benefit from an emotion regulation intervention.

Acceptance and Commitment Therapy

Acceptance and Commitment Therapy (ACT; Hayes et al., 1999) is a third-wave cognitive-behavioral therapy. ACT guides individuals toward being mindful, aware, and accepting of painful thoughts and feelings, while emphasizing the need to engage in committed actions to move toward one's life values. ACT has demonstrated efficacy for a variety of psychological difficulties. Forman et al. (2007) found ACT to have equivalent treatment outcomes for individuals with anxiety and depression when compared to cognitive therapy. Additionally, Arch et al. (2012) reported ACT and CBT having similar utility for individuals with mixed anxiety disorders, providing support for its use in treatment.

Six Core Therapeutic Processes of ACT. ACT includes six core therapeutic processes targeted in treatment, including acceptance, cognitive defusion, present moment awareness, self-as-context, values, and committed action (Hayes et al., 1999). The culmination of these six factors comprise psychological flexibility, and increasing psychological flexibility is the overall goal of ACT (Hayes et al., 2006). Hayes et al. (2006) describe psychological flexibility as “the ability to contact the present moment more fully as a conscious human being, and to change or persist in behavior when doing so serves valued ends” (p. 14). Further, the six core therapeutic processes of ACT are not conceptualized as modes of reducing psychopathological symptoms, as is common among other forms of psychotherapies. Rather, ACT uses each of the six core processes to promote overall wellbeing and psychological flexibility.

The six core processes of ACT are inextricably linked and also build upon one another. Acceptance promotes an individual’s willingness to experience, rather than avoid, thoughts, emotions, feelings, and sensations as they arise (Hayes et al., 2006). In ACT, acceptance requires individuals to stay engaged in the present moment in order to become a mechanism by which meaningful action towards one’s values can be taken (Luoma et al., 2018). Cognitive defusion refers to the attempt to change the experience an individual has when interacting with their thoughts, rather than attempting to change the content or frequency of the thoughts, with the overall goal of weakening the literality of the thoughts themselves (Hayes et al., 2006). Present moment awareness is an engagement with the moment in which an individual finds themselves, both internally and externally (Luoma et al., 2018). The goal of teaching present moment awareness in ACT and staying present is to increase the likelihood of an individual to maintain flexibility and act in a way to moves them closer toward their life values. Self-as-context is a sense of awareness and self that allows an individual to engage in the present moment without

attachment to prescribed ideas about their identity (Hayes et al., 2006; Luoma et al., 2018). It is the act of being present and aware that one is having their own thoughts and experiences, while other individuals are having their own (Luoma et al., 2018). It removes the “self-as-concept” that creates “I am” statements about one’s identity, which typically lead to rigid cognitive, emotional, and behavioral patterns. Values are chosen life directions that can be continuously acted upon, rather than achieved or crossed off of a list like a goal (Hayes et al. 2006; Luoma et al., 2018). Engaging with and taking meaningful action toward one’s values is the goal of ACT. Lastly, committed action is the process by which an individual engages in behaviors that lead them closer to their valued life directions and result in longstanding behavior change (Hayes et al., 2006).

The ACT model suggests that the root of psychopathology is psychological inflexibility, which is comprised of the opposite processes that make up psychological flexibility (Luoma et al., 2018). Psychological inflexibility includes experiential avoidance, cognitive fusion, a lack of attention to the present moment, an attachment to one’s conceptualized self, a lack of connection with one’s values, and an inability to engage in effective action towards ones values.

Emotion Regulation and ACT. From an ACT perspective, emotion dysregulation is the product of experiential avoidance (Blackledge & Hayes, 2001). Experiential avoidance is considered to be the opposing process to acceptance, which results in psychological inflexibility (Hayes et al. 2006). According to Hayes et al., (1999), “experiential avoidance is the phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of those events and the contexts that occasion them” (p. 1154). The previously mentioned emotion regulation strategy of suppression could be

considered a mechanism by which individuals engage in experiential avoidance. At times, avoidance can be beneficial, such as when one needs to remain professional in a meeting after receiving unpleasant news; however, experiential avoidance often results in unhelpful behavioral choices, such as heavy alcohol use or risky sexual behavior (Blackledge & Hayes). These authors outline that negative emotions themselves are not harmful or necessarily problematic; rather, it is the way one interacts with their emotions, by way of human language, that is ultimately harmful. Effective emotion regulation strategies, such as acceptance, are not intuitive to all people; thus, the means by which emotion regulation is typically attempted is through experiential avoidance. However, the authors suggest that when individuals are unwilling to experience emotions, typically negative emotions, they may actually increase in intensity and frequency, leading to further distress and attempts to avoid them, which is consistent with the results of Gross (2002). Given that meaningful action toward personally-defined values cannot be taken in a state of avoidance, emotion dysregulation by way of experiential avoidance serves to wreak havoc in many people's lives by disrupting progress toward goals.

Beyond a conceptual level, the relationship between experiential avoidance and emotion dysregulation has been documented in the literature. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a commonly used and psychometrically sound measure of emotion dysregulation. Higher scores on the DERS indicate greater emotion regulation difficulty, and DERS scores have been positively associated with experiential avoidance and negatively associated with mindfulness (Gratz & Roemer, 2004). Additionally, Gratz and Tull (2010) state that acceptance- and mindfulness-based treatments, including ACT, may lend themselves well to help with problems commonly associated with emotion dysregulation.

ACT-Based Interventions for Student Populations. An increasing number of ACT interventions are being implemented with various populations (e.g., school-aged children, university students, parents). More specifically, an ACT-based psychoeducation group was implemented for engineering students, a traditionally demanding and rigorous field of study, and found to have positive effects on academic performance (Abiadbe & Moliski, 2020). Of the engineering students who participated in the ACT experimental group, 46% achieved higher grade point averages than their equivalent counterparts in the control group after receiving the intervention, even though only 20% were predicted to achieve higher grade point averages.

In a study of graduate behavior analysis and therapy students, a six-week ACT-based values clarification and committed action program was implemented and compared with a six-week study skills group (Paliliunas et al., 2018). The ACT intervention group resulted in students achieving higher test scores throughout the semester and higher levels of psychological flexibility than the control group. The authors state that the intervention was relatively easy to implement into a pre-existing graduate course and did not result in an increased workload for the instructor. Additionally, they cite the known levels of high stress among graduate students, low mental health service utilization, and high attrition rates of graduate students. The authors propose using ACT-based, course-implemented interventions to improve both the academic and mental health outcomes of graduate students from a preventative standpoint.

In a sample of Australian university students, the use of a web-based ACT intervention to promote mental wellbeing of students was supported (Viskovich & Pakenham, 2019). Participants in the ACT intervention group saw improvements on most pre- to post-intervention measures, and their improvements were mostly maintained until the follow-up period. Rates of mild and moderate clinical distress were high among students (depression = 40.3%, anxiety =

39.1%, stress = 39.6%), and rates of severe and extremely severe clinical distress were also notable (depression = 14.1%, anxiety = 19%, stress = 12.4%). Despite the high levels of distress reported by students, students with mild to extremely severe levels of distress had similar outcomes from the ACT intervention when compared to students without clinical levels of distress. The authors report this as a strength of their intervention, highlighting the potential for ACT-based interventions to be used transdiagnostically to benefit individuals experiencing various forms of psychopathology. Their intervention resulted in not only improved mental health outcomes, but also positive academic outcomes.

THE STUDY

The proposed study implemented and evaluated the effectiveness of an Acceptance and Commitment Therapy (ACT) derived values-based self-management intervention with undergraduate students. The intervention aimed to provide support to undergraduate students in their pursuit of personally defined goals through the use of individual behavioral and therapeutic exercises. Participants identified behaviors in their lives that they can target to increase or decrease in frequency to achieve their goal. Additionally pre- and post-measures of emotion regulation, psychological flexibility, values-behavior coherence, well-being, stress, and self-regulation were included to monitor for changes in any of these domains over the course of the intervention.

Research Questions

This study aims to answer the following questions:

1. Can a brief ACT-based self-management program help undergraduate students make meaningful and measurable progress toward a behavioral goal of their choice?
2. Can a brief ACT-based self-management program improve undergraduate students' emotion regulation ability?

Method

All parts of this study were approved by the Missouri State University Institutional Review Board (IRB-FY2021-410; Approval Date: February 24, 2021; see Appendix A).

Participants and Setting. Participants were initially four undergraduate students at a midwestern university recruited via emails sent from academic advisement coordinators in students' program of study. The study experienced attrition of one participant, resulting in a total

of three participants. Participant 1 was a 21-year-old female identifying undergraduate student, Participant 2 was a 28-year-old female identifying undergraduate student, and Participant 3 was a 19-year-old male identifying undergraduate student.

Participants were not required to meet specific criteria for participation but needed access to a smartphone or computer with internet access throughout the duration of the study. There were no specific incentives for participation, but participants were informed of the potential psychological, academic, or personal benefits of participation. Participants were advised that the study was not intended to replace individual psychotherapy and told they would be provided information about university counseling services if need arose.

All sessions were facilitated by two trained graduate research assistants currently pursuing master's degrees in clinical psychology and took place over an IRB-approved online meeting platform (e.g., Zoom). Research assistants completed any additional communication with participants via the university email server. The weekly sessions were scheduled at a day and time convenient to the student.

Research Design. The study utilized a multiple baseline single subject experimental design across participants. Additionally, participants completed pre- and post-intervention self-report questionnaires.

Procedure

Recruitment information sent from academic advisement offices to undergraduate students included a recruitment flyer and consent form; students indicated participation interest by completing a survey via a secure online survey platform (e.g., Qualtrics). These students then scheduled a virtual meeting on Zoom with the researcher to review the consent

form and discuss any questions about study participation. At this time, students chose to participate in the study by completing the consent form.

The intervention included three components: an intake meeting, baseline data collection, and the weekly intervention. The initial intake meeting lasted approximately 60 minutes; during this time the researcher interviewed the participant using a structured client interview (see Appendix B) and participant completed self-report measures (discussed below). The information gathered from the structured interview guided the researchers' choice of therapeutic interventions for participants during the study. During the intake meeting, the researcher and participant collaboratively determined the appropriate self-monitoring data to be collected based on the participant's target behavior for the study, which related to current academic or personal difficulties, as well as how to measure the behavior (e.g., minutes per day) to ensure it was measurable and quantifiable. This self-monitoring data was collected during participants' baseline periods, which varied in length from three to seven days due to the experimental design. Daily self-monitoring data was collected using an electronic smartphone ecological momentary assessment app (e.g., ExpiWell) and took approximately one to three minutes to complete each day. The ExpiWell application delivered a notification to the participants' cell phones at 7:00pm every day; if the participants did not respond before 9:00pm, a reminder notification would be sent.

The second meeting lasted approximately 60 minutes and consisted of ACT-based exercises (see Appendix C) designed to assist the participant in identifying or clarifying their personal values that relate to their goal or target behavior for the study. Additionally, the researcher and participant identified specific variables or factors in their life that were causing, maintaining, or perpetuating their current difficulty engaging in their desired behaviors (e.g.,

skills deficits, time management challenges, emotional concerns, etc.) and strategies they were currently using to cope or manage with these behaviors. Finally, the participant developed a behavioral (i.e., specific, measurable) goal related to the behavior they desired to change and determined a plan to achieve this goal using self-management techniques. Participants continued collecting self-monitoring data following their baseline period. Starting subsequent the second meeting and continuing until the end of the study, this self-monitoring data included a measurement (e.g., minutes per day) of participants' progress toward their goal and three questions pertaining to their psychological flexibility, emotion regulation, and self-regulation that day. Collection of this data took approximately one to three minutes per day. The ExpiWell application delivered a notification to the participants' cell phones at 7:00pm each day; if the participants did not respond before 9:00pm, a reminder notification would be sent.

The third through sixth weekly meetings included: a review of self-monitoring data with feedback from the researcher about progress toward the goal; a brief mindfulness exercise; development of psychological flexibility using therapeutic exercises adapted from two ACT books, *Get out of Your Mind and Into Your Life* (Smith & Hayes, 2005) and *The ACT Matrix: A New Approach to Building Psychological Flexibility Across Settings and Populations* (Polk et al., 2016); and setting a goal and identifying committed actions to reach that goal for the following week. See Appendix D for further information about the specific topics covered during each session. Participants continued collecting their self-monitoring data and completing their three self-report questions daily until the sixth and final meeting.

The final (sixth) meeting included a review of participants' progress toward their goal and the current state of their target behavior, development of a plan to maintain improvements following

their participation in the study, completion of the initial intake self-report measures, and completion of a social validity measure questionnaire.

Measures

Acceptance and Action Questionnaire-II. The Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011) is a seven-item measure of psychological flexibility. Respondents answer items on a seven-point Likert scale (1 = *rarely true*, 7 = *always true*) based on how often the statements are true for them. It was adapted from the Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004) in order to improve the psychometric properties of the original measure of psychological flexibility. A Confirmatory Factor Analysis procedure was utilized to identify one factor of psychological flexibility with seven individual items that significantly load onto that factor. The AAQ-II has acceptable internal consistency, with alpha coefficients between .78 and .88. It has acceptable test-retest reliability at three and twelve months and has retained its psychometric properties when used with varying populations in different countries. Self-reports of higher levels of psychological inflexibility on the AAQ-II are associated with higher levels of depression, anxiety, and stress.

College Student Subjective Wellbeing Questionnaire. The College Student Subjective Wellbeing Questionnaire (CSSWQ; Renshaw, 2020) is a sixteen-item self-report measure in which students rate their level of wellbeing. Each item is answered using a seven-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*) to rate the degree to which they agree with the statements. The measure gathers an overall wellbeing score as well as subscale scores for academic satisfaction, academic efficacy, school connectedness, and college gratitude. The CSSWQ has high internal consistency ($\alpha = .91$) and each subscale has acceptable internal

consistency ($\alpha = .79-.88$) (Renshaw, 2018). Two Confirmatory Factor Analyses reveal adequate data-model fit. Factor loadings for each of the measure's four subscales are robust ($\lambda = .60-.92$) and latent construct reliability of each subscale is strong ($H \geq .80$). Additionally, the CSSWQ was found to have good convergent validity; the measure's scales correlated in the expected direction were other criterion measures of constructs such as depression, anxiety, and life satisfaction.

Comprehensive Assessment of Acceptance and Commitment Therapy Processes.

The Comprehensive Assessment of Acceptance and Commitment Therapy Processes (CompACT; Francis et al., 2016) is a 23-item measure of ACT processes. Respondents answer questions using a seven-point Likert scale (0 = *strongly* disagree, 6 = *strongly* agree). Exploratory Factor Analysis and Principle Axis Factoring ultimately produced a three-factor model of the ACT processes, including “openness to experience and detachment from literalness,” “self-awareness and perspective taking,” and “motivation and activation” (Francis et al., 2016). Factor 1, “openness to experience and detachment from literalness” represents acceptance and defusion, factor 2, “self-awareness and perspective taking” represents present moment awareness and self-as-context, and factor 3, “motivation and activation” represents values and committed action. The CompACT has high internal consistency, with Cronbach's alpha at .91 for the overall measure and between .87 and .90 for subscales. The CompACT was found to have good convergent validity with the aforementioned AAQ-II (Bond et al., 2011), another measure of ACT processes.

Difficulties in Emotion Regulation Scale-18. The Difficulties in Emotion Regulation Scale-18 (DERS-18; Victor & Klonsky, 2016) is an 18-item self-report measure of emotion dysregulation shortened from the original 36-item Difficulties in Emotion Regulation Scale

(DERS; Gratz & Roemer, 2004). The DERS-18 retains half of the original items of the DERS and includes statements assessing one's experience with their emotions. Individuals answer the items using a five-point Likert-scale (1 = *almost never (0-10%)*, 5 = *almost always (91-100%)*) to indicate how often the statements apply to them. Like the DERS, the DERS-18 contains six subscales, including lack of emotional awareness, lack of emotional clarity, difficulty engaging in goal-directed behavior, impulse control difficulties, nonacceptance of emotional responses, and limited access to emotion regulation strategies.

Since the DERS-18 has nearly identical psychometric properties and clinical utility as the original DERS, it will be used since it takes less time to complete, placing less burden on participants (Victor & Klonsky, 2016). The DERS-18 has high internal consistency overall ($\alpha = .91$), with individual subscale alphas between .77 and .90. Concurrent validity of the DERS-18 was measured with the DERS, and the overall correlation was .98. Additionally, individual subscales of the DERS-18 were found to correlate highly with the individual subscales of the DERS. Convergent validity was assessed by correlating the DERS-18 with other measures of Borderline Personality Disorder, a condition hallmarked with intense emotion dysregulation; all correlations were found to be statistically significant.

Perceived Stress Scale. The Perceived Stress Scale – 10 Item (PSS-10; Cohen et al., 1983) is a ten-item self-report measure of stress. Respondents answer items using a five-point Likert scale (0 = *never*, 4 = *very often*) based on how often they felt or thought consistent with the items in the past month. In a review of the psychometric properties of the Perceived Stress Scale in its fourteen-, ten-, and four-item versions across multiple studies, the PSS-10 was found to be psychometrically sound and superior to the fourteen- and four-item versions (Lee, 2013). Across multiple studies, the PSS-10 had acceptable Cronbach alpha levels ranging from .74 to

.91. Test-retest reliability was found to be acceptable ($\alpha > .72$) in a range of studies assessing one-week, two-week, and four-week test-retest reliability. After six weeks, test-retest reliability decreases, which seems intuitive given that the measure is assessing perceived stress over the past month and stress levels fluctuate over time.

Short Self-Regulation Questionnaire. The Short Self-Regulation Questionnaire (SSRQ; Carey et al., 2004) is a 31-item self-report measure of self-regulation, which they describe as the ability to regulate behavior in order to achieve a desired outcome. Respondents rate the extent to which they agree with the 31 statements on a five-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). In the first psychometric analysis of the SSRQ, it was found to have high internal consistency ($\alpha = .92$) and was highly correlated with the standard 61-item Self-Regulation Questionnaire ($r = .96$).

Values Behavior Coherence Questionnaire. The Values Behavior Coherence Questionnaire (VBCQ; Paliliunas & Frizell, in preparation) is a six-item self-report measure of how closely one's global values and overall behavior are aligned. Respondents answer questions on a five-point Likert scale (1 = *never true*, 2 = *always true*) based on how frequently true the statements are to them given their thoughts and actions over the past month.

Daily Self-Monitoring Data and Participant Goals. The primary dependent variable of the study is the participants' self-monitoring data. Each day throughout the duration of the study, participants recorded their target behavior goal progress using quantifiable units predetermined with the researcher during the intake session. All participants measured their goal progress in minutes per day. Details pertaining to each participants' goals, target behavior, and self-monitoring data collection methods are included.

In addition, they completed three daily self-report items, one of values-behavior coherence, emotion regulation, and goal-oriented behavior. Two daily self-report items were adapted from item 6 on the Values Behavior Coherence Questionnaire (VBCQ; Paliliunas & Frizell, in preparation) and item 4 on the Difficulties in Emotion Regulation Questionnaire-18 (DERS-18, Victor & Klonsky, 2018). The final item related to goal-oriented behavior. Participants were instructed to answer these items based on their behavior in the past 12 hours and self-report items were adapted as necessary to reflect this timeframe. Items and their given Likert scales include the following:

1. In the past 12 hours, my values were closely aligned with my daily actions. (1 = *never true*, 2 = *seldom true*, 3 = *sometimes true*, 4 = *often true*, 5 = *always true*)
2. In the past 12 hours, I was attentive to my feelings. (1 = *almost never (0-10% of the time)*, 2 = *sometimes (11-35% of the time)*, 3 = *about half of the time (36-65% of the time)*, 4 = *most of the time (66-90% of the time)*, 5 = *almost always (91-100% of the time)*)
3. In the past 12 hours, if I felt stressed, I was able to adapt and stay focused on my goals. (1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*)

Participant 1. Participant 1 set a goal to decrease the amount of time spent daydreaming to under three hours per day. The participant defined daydreaming as spending time attending to hypothetical or potential situations playing out in their mind while pacing and listening to music. For the purpose of this study, Participant 1 measured their target behavior of daydreaming in minutes per day; this data was recorded by the participant and reported daily via the ExpiWell app.

Participant 2. Participant 2 set a goal to decrease the amount of time they spent on free time/leisure to between 60 and 90 minutes each day. The Participant defined free time as use of her cell phone for purposes such as social media and/or television/video consumption using

electronic devices. They measured this target behavior in minutes per day; this behavior was recorded by the participant and reported daily via the ExpiWell app.

Participant 3. Participant 3 set a goal to create greater consistency in their study habits by studying between 50 and 90 minutes per day outside of class rather than cramming for exams. The overall goal was to increase the frequency that they studied but reduce the amount of time spent studying per day overall; the participant defined studying as time spent working on academic-related tasks. This participant used time spent studying at their target behavior and measured it in minutes per day; this behavior was recorded by the participant and reported daily via the ExpiWell app.

RESULTS

Research question one, “can a brief ACT-based self-management program help undergraduate students make meaningful and measurable progress toward a behavioral goal of their choice,” received support. Details about participants’ self-monitoring data of their goal progress is included below.

Self-Monitoring Data

Participants’ cumulative self-monitoring data is displayed in Appendix E. Their baseline and intervention trendlines are included to provide a comparison of how their behavior would be expected to progress without intervention to how their behavior actually progressed with the implementation of the intervention.

During a seven-day baseline, Participant 1 engaged in a mean of 251 minutes of daydreaming behavior per day and a cumulative sum of 1803 minutes. During a four-day baseline, Participant 2 engaged in a mean of 198 minutes of free-time behavior per day and a cumulative sum of 800 minutes. During a five-day baseline, Participant 3 engaged in a mean of 120 minutes of studying per day and a cumulative sum of 540 minutes.

During the intervention condition, Participant 1 engaged in a mean of 148 minutes of daydreaming behavior per day and a cumulative sum of 4517 minutes, demonstrating the desired decrease in this target behavior from baseline. Participant 2 engaged in a mean of 108 minutes of free-time behavior per day and a cumulative sum of 2830 minutes, demonstrating the desired decrease in this target behavior from baseline. Participant 3 engaged in a mean of 59 minutes per day of studying behavior and a cumulative sum of 1470 minutes. On Appendix E, missing data

points reflect days participants did not complete their self-monitoring surveys in the ExpiWell application.

Linear Regressions. Linear regressions were fit to both baseline and intervention data for each participant (see Appendix E). Participant 1 collected 28 data points during their intervention condition and five additional data points following the conclusion of the intervention; 10.71% of these data points exceed the number of minutes predicted by the baseline regression ($y=253.5x+10$). As the participant's goal was to reduce the number of minutes per day spent on their target behavior of daydreaming, this data suggests 89.29% of these data points support this reduction in responding. The rate coefficient produced by this linear regression indicates a predicted daily response of 253.5 minutes, meaning it would be predicted that the participant engage in 253.5 minutes per day of their daydreaming behavior. For Participant 1, daily totals exceeded this predicted amount on 14.29% of days that data were reported; because this participant was seeking to decelerate this behavior, the data implies that 85.71% of data points achieved this aim.

Participant 2 collected 23 data points during the intervention condition; 8.7% of these data points exceed the number of minutes predicted by the baseline regression ($y=195x+25$). The Participant aimed to reduce the amount of time spent on their target behavior of free-time/leisure each day, and this data suggests 91.3% of these data points support this reduction in responding. The rate coefficient indicates a predicted daily response of 195 minutes, meaning it would be predicted that the participant engage in 195 minutes per day of their target behavior. For Participant 2, daily totals exceeded this predicted amount on 13.04% of days that data were reported; because this participant was seeking to decelerate this behavior, the data illustrates that 86.96% of data points achieved this aim.

Participant 3 collected 21 data points during their intervention period; 21.74% of these data points exceeded the number of minutes predicted by the baseline regression ($y=120x-132$). The rate coefficient produced by this linear regression suggests a predicted response of 120 minutes, meaning it would be predicted that the participant engage in 120 minutes per day of their target studying behavior. For Participant 3, daily totals met or exceeded this predicted amount on 33.33% of days; approximately two thirds of the data points fell below this predicted amount. Because this participant was seeking to accelerate this behavior on a daily basis, but also keep it between 50 and 90 minutes, it may be more helpful to consider how frequently their behavior fell within their desired time range. On 71.42% of days data were recorded, Participant 3 reported studying between 50 and 90 minutes.

Visual and quantitative analyses demonstrate significant reductions in the target behaviors of Participant 1 and Participant 2 over the course of this intervention. Most self-monitoring data for Participants 1 and 2 fell outside of the range of what would have been expected based upon their recorded self-monitoring data during their baseline periods. Visual and quantitative analysis suggest Participant 3 did not experience as significant of changes in target behavior as recorded in minutes per day as Participants 1 and 2 did throughout the intervention period. This could potentially be an artifact of missing self-report data and results should be interpreted with caution. However, it should also be considered that Participant 3 aimed to keep their target behavior within a certain range. The rate coefficient produced by this participant's intervention data linear regression ($y=45.431x+636.31$) suggests a predicted response of 45.4 minutes per day spent on their target behavior if their intervention trend continues beyond this intervention. This number could potentially indicate that the participant is engaging in more regular studying behavior for shorter durations of time, which would reflect

progress toward their goal and aim for the study, although they would need to demonstrate a slight increase in daily responded and engage in more consistent data reporting.

Daily Self-Report Data. Participants completed three self-report questions on their daily self-monitoring survey using the ExpiWell mobile app during their intervention period. Given the phrasing of the self-report questions and the construction of the Likert scales, higher scores out of 1 to 5 indicate higher levels of values-behavior coherence, emotion regulation, and goal-directed behavior in the face of stress.

Participant 1 reported an average response of “Sometimes True” to indicate how aligned their values and behavior over the past twelve hours ($M = 3.32$; median = 3; range = 2-5), an average response of “Sometimes” to indicate how often they were attentive to their feelings over the past twelve hours ($M = 2.87$; median = 3; range = 1-5), and an average response of “Neutral” to indicate how well they were able to adapt and stay focused on their goals in the face of stress ($M = 3.52$; median = 3; range = 2-5).

Participant 2 reported an average response of “Sometimes True” to indicate how aligned their values and behavior over the past twelve hours ($M = 3.37$; median = 3; range = 2-5), an average response of “About half the time” to indicate how often they were attentive to their feelings over the past twelve hours ($M = 3.72$; median = 4; range = 2-5), and an average response of “Agree” to indicate how well they were able to adapt and stay focused on their goals in the face of stress ($M = 4.10$; median = 4; range = 2-5).

Participant 3 reported an average response of “Sometimes True” to indicate how aligned their values and behavior over the past twelve hours ($M = 3.75$; median = 4; range = 2-5), an average response of “About half the time” to indicate how often they were attentive to their feelings over the past twelve hours ($M = 3.70$; median = 2; range = 2-5), and an average response

of “Neutral” to indicate how well they were able to adapt and stay focused on their goals in the face of stress ($M = 3.65$; median = 4; range = 2-5).

Self-Report Data via Pre- and Post-Measures

As previously stated, participants completed self-report measures of psychological flexibility, emotion regulation, self-regulation, college student well-being, values-behavior coherence, and stress as supplemental indicators of changes in their responding. Given the single-subject experimental design, self-report data cannot be generalized beyond the context of the study. However, individual self-report changes may provide insight into changes specific to participants. Participants’ pre- and post-intervention self-report questionnaire results are depicted in Appendix F, and research question two, “can a brief ACT-based self-management program improve undergraduate students’ emotion regulation ability,” received support and will be discussed in further detail.

Participant 1 experienced changes in the therapeutic direction on all self-report measures. Participant 1 achieved scores on the AAQ-II and CompACT, measures of psychological flexibility, that indicate increases in psychological flexibility. They demonstrated a two point reduction on the AAQ-II from baseline to intervention; lower scores on this measure correlate with greater psychological flexibility. They achieved an overall 31 point increase on the CompACT, where increases imply greater psychological flexibility; increases also occurred on all subscales of this measure, including openness to experience, behavioral awareness, and valued action. The response difference between pre- and post-intervention on the DERS-18, a measure of emotion regulation, indicated a 33 point decrease in emotion regulation difficulties, where lower overall and subscale (awareness, clarity, goals, impulse, nonacceptance, and

strategies) scores suggest better emotion regulation. This participant showed an 11 point increase on the VBCQ, a measure of values-behavior coherence, indicating greater values-behavior coherence after the intervention than at baseline. On the CSSWQ, Participant 1 reported a 15 point increase in overall college student subjective wellbeing, where higher overall and subscale (academic satisfaction, academic efficacy, school connectedness, and college gratitude) scores demonstrate greater subjective wellbeing. Reported self-regulation ability as measured by the SSRQ also improved from baseline to intervention, with Participant 1 reporting a 16 point increase in scores. Finally, Participant 1 achieved a two point decrease in their perceived stress from baseline to intervention, as measured by the PSS, where lower scores indicate lower levels of perceived stress.

Participant 2 experienced changes in the therapeutic direction on most measures included in the study with the exception of perceived stress, on which they indicated a small change opposite the therapeutic direction. First, on both measures of psychological flexibility, the AAQ-II and the CompACT, Participant 2 demonstrated increased psychological flexibility from baseline to intervention. Specifically, they reported a seven point decrease in scores on the AAQ-II, where lower scores reflect better psychological flexibility. On the CompACT, they reported an overall increase of 69 points, with additional increases across all subscales. On the DERS-18, Participant 2 achieved a 15 point decrease in scores from baseline to intervention, reflecting fewer difficulties in emotion regulation after the intervention. Decreases across all DERS-18 scales, with the exception of the impulse scale, were also achieved, again reflecting fewer emotion regulation difficulties after the intervention. Changes from pre- to post-intervention of three points imply greater values-behavior coherence. On the CSSWQ, Participant 2 indicated a 20 point increase in overall college student subjective wellbeing, where higher scores relate to

greater subjective wellbeing; increases across all of this measure's subscales (academic satisfaction, academic efficacy, school connectedness, and college gratitude) also illustrate greater subjective wellbeing. The participant reported a 41 point increase on the SSRQ, and higher scores on this measure are indicative of greater self-regulation ability. Differences of two points in Participant 2's PSS scores reflect increased perceived stress. However, comments made by this participant during intervention sessions and the time at which the post-intervention measures were administered suggest final examinations and other end of semester stressors may account for the increases in stress.

Participant 3 experienced changes in the therapeutic direction across all constructs measured via self-report questionnaires. First, on both measures of psychological flexibility, the AAQ-II and the CompACT, Participant 3 illustrated increased psychological flexibility from baseline to intervention. Specifically on the AAQ-II, they reported an eleven point decrease in scores, where lower scores reflect better psychological flexibility. On the CompACT, where increases in scores represent greater psychological flexibility, they reported an overall increase of 34 points, with additional increases across all subscales. On the DERS-18, Participant 3 achieved a 38 point decrease in scores from baseline to intervention, reflecting fewer difficulties in emotion regulation after the intervention; decreases across all DERS-18 subscales also reflect fewer emotion regulation difficulties after intervention. Greater values-behavior coherence is implied by this participant's ten point increase on the VBCQ from baseline to intervention. On the CSSWQ, a 23 point increase suggests increased overall college student subjective wellbeing for this participant; increases across all of this measure's subscales (academic satisfaction, academic efficacy, school connectedness, and college gratitude) similarly reflect increased subjective wellbeing. The participant demonstrated a 39 point increase on the SSRQ, where

higher scores on this measure are indicative of greater self-regulation ability. Finally, Participant 3's eight point decrease on the PSS implies decreased perceived stress from baseline to intervention.

Treatment Fidelity and Interobserver Agreement

Researchers recorded all sessions conducted with participants via Zoom, excluding the initial intake meeting, to assess for treatment fidelity and interobserver agreement. Treatment fidelity of 30% of the sessions was assessed, which includes five of the 15 total sessions recorded. Four trained undergraduate and graduate observers viewed the recorded videos and completed an 8-item (Values and Goal setting meeting) or 5-item (Matrix sessions) treatment fidelity checklist regarding each element of the session (e.g. "Researcher facilitated discussion about self-monitoring data and provided feedback to participant."). Across both researchers and the different sessions of this protocol, treatment fidelity is high; the mean score across videos was 100%. Interobserver agreement was collected for 40% of the recorded videos; total count IOA was determined by calculating the sum of the number of treatment fidelity scores agreed upon by the observers, dividing this by the total number of videos, and multiplying by 100. There was 100% agreement among observers.

Social Validity

Participants' social validity responses are included in Appendix G. Overall, participants rated their experience with the intervention is very positive.

DISCUSSION

A six-week values-based self-management program for undergraduate students resulted in meaningful behavior change and changes in emotion regulation, psychological flexibility, college student wellbeing, self-regulation, perceived stress, and values-behavior coherence. The program was implemented by trained graduate student researchers and required minimal time for participants outside of session, making it a treatment protocol that was both feasible for researchers to implement and for participants to complete, as it maximized its use of time and financial resources. Data was primarily analyzed by assessing cumulative self-monitoring data and comparing participants' reports of their self-monitoring data during the intervention period to what would have been expected from their baseline self-monitoring data.

Participants met with a researcher for a weekly hour-long meeting for a total of six weeks. The intervention included an intake meeting with a researcher to gather information to aid in participants' choices of target behaviors and goals for the study, a values and goal setting meeting during which participants' related their own values and goals to their desired behavior change, and four weekly ACT-based sessions used to facilitate the development of psychological flexibility and emotion regulation. Researchers administered pre- and post-intervention self-report questionnaires of psychological flexibility, emotion regulation, values-behavior coherence, college student wellbeing, and self-regulation. Between sessions, participants collected a daily measurement of their self-monitoring data and recorded it in the ExpiWell mobile app.

Both research questions pertaining to whether a brief ACT-based program could (1) help undergraduate students make meaningful progress toward a behavioral goal of their choice and (2) improve their emotion regulation ability received support.

Implications

As previously stated, college students face high levels of stress and mental health concerns (American College Health Association, 2019). Additionally, recent trends indicate increased mental health treatment utilization among college students at their universities, and college counseling centers are experiencing difficulties meeting the current demand for services (Center for Collegiate Mental Health, 2016). This intervention protocol may provide one unique way to address growing mental health concerns among college-attending young adults who do not have access to or who do not benefit from traditional talk therapy. Given the variety of stressors college students face (e.g., academics, leaving home for the first time, initial onset of psychological conditions, forming friendships and romantic relationships), versatile wellbeing interventions will prove most helpful. This brief protocol allows participants to focus on a goal relevant and important to their wellbeing while providing them with specific, actionable skills and knowledge to work toward their goals. While this protocol may not be appropriate for all students requiring mental health services, such as students with severe psychiatric conditions or substance use disorders, it could potentially mitigate long waitlists and burdens on staff at counseling centers by addressing the specific needs of some students.

Specifically, this study suggests that undergraduate students' psychological flexibility, emotion regulation, subjective wellbeing as a college student, values-behavior coherence, stress, and self-regulation may be specifically amenable to change using a procedure similar to this

intervention. In a brief six-week period, participants reported positive changes in the aforementioned domains, as measured by psychometrically reliable and valid self-report questionnaires. Additionally, qualitative data from reflections made during intervention sessions with researchers also suggest positive changes in participants' target behaviors and levels of psychological flexibility, even in the absence of the self-report measures.

As detailed in the introduction, emotion regulation and dysregulation are implicated in psychopathology and substance use concerns (Dvir et al., 2014). The ACT model of psychopathology suggests experiential avoidance is at its root, and experiential avoidance and emotion dysregulation are highly correlated (Blackledge & Hayes, 2001). Participants reported high overall levels of emotion regulation difficulties on the DERS-18 (Victor & Klonsky, 2016) and experiential avoidance on the CompACT (Francis et al., 2016) at pre-intervention. Given the relationship between emotion dysregulation and experiential avoidance with psychopathology, in conjunction with our participants' self-report data and personal goals, we spent significant time in session emphasizing the use acceptance/willingness and defusion processes, while deemphasizing the use of avoidance tactics. Intuitively, one would expect these focuses to result in decreases emotion regulation difficulties and experiential avoidance at post-intervention. Participants reported changes in the therapeutic direction of emotion regulation, as measured by DERS-18, and experiential avoidance, as measured by the Openness to Experience subscale of the CompAct were reported by participants. This study provides evidence to suggest that emotion regulation difficulties, a hallmark and common factor of many forms of psychopathology, may be able to be altered in short time frames using ACT-based procedures. Given the detriment that a lack of emotion regulation ability can have on overall mental health and wellbeing, interventions to specifically targeting emotion regulation difficulties are needed.

Strengths and Limitations

The single subject experimental design is both a strength and a limitation of this study. Nock and colleagues (2007) outline various strengths and limitations of single-subject research which will be applied to the current study. First, the design is both time and cost effective compared to randomized controlled that can require large amounts of staff and money to implement. We implemented this intervention, which is just one iteration of other values-based self-management programs, quickly and easily. The results of this brief study can be used to tailor future values-based self-management protocols in future research so that the most efficacious and resource-effective version can be implemented if supported by research. Given growing mental health concerns among college students, it is imperative that efforts are made to increase treatment accessibility and utility.

Second, the single-subject design allows for greater individualization and tailoring of the intervention to best fit the needs of the participant (Nock et al., 2007). To create interventions that can be flexibly, accurately, and easily implemented by clinicians who provide mental health services, it should be assumed that modifications will be both necessary and required for many people receiving treatment. Though this can also result in a lack of generalization from an external validity standpoint, large randomized controlled trials offer little opportunity in the area of tailoring treatment to fit people's needs. In addition, the multiple baseline component of this research design is one way to approach external validity concerns. The multiple baseline is utilized to provide further evidence that any observed treatment effects are due to the introduction of the intervention, rather than due to outside factors.

Considering again the aforementioned time and cost effectiveness of single subject designs, the ease of implementation of this study is a strength. Students in a clinical psychology

master's program were trained to implement this intervention. It is reasonable to assume that other students, research assistants, or unlicensed mental health workers could be trained to implement the intervention well. According to the American Psychological Association's website (updated 2017), individual therapy often lasts 15 to 20 sessions. While longer treatment may be preferable to some people, it is not available to or accessible for all people. Additionally, within the context of a university, 15 to 20 sessions may not be a practical timeframe for students who have busy schedules with school or who are limited within the timeframe of an academic semester. This intervention provides a viable alternative to traditional treatment modalities that require more time and financial resources for people to experience benefits. Though this intervention would not constitute individual therapy, it helps individuals work toward a goal related to their overall well-being, which is often a focus on individual therapy.

Despite the benefits of using a multiple baseline design, this study included a minimal number of participants required to utilize this type of experimental design. A larger sample size with a more heterogenous makeup of students would allow for further discussion of how the study results could be widely applied to different groups of people. Additional studies could benefit from the inclusion of non-traditional students and more students from underrepresented or minority groups.

Finally, the context of the ongoing COVID-19 pandemic presented unique challenges for this study. The study was implemented entirely remotely and only self-report data was collected from participants. First, the remote delivery may have decreased some students' interest in participating in the study, leading to the limited sample size. Participant 1 provided feedback after the intervention that they would have preferred to complete the intervention in-person. Next, self-reported data can be susceptible to bias. There may have been days when participants

were unable to accurately capture a true measurement of their target behavior. In addition, due to the nature of our self-report data collection, inconsistencies with which data was recorded in the ExpiWell application for Participant 3 resulted in missing data and perhaps in inaccurate reflection of their values-based behavior change.

Despite limitations, social validity reports from experiences with the study suggest that it was well-received by participants, relevant to their lives, and something they would recommend to another person. A recent meta-analysis suggests the dropout rate in various forms of psychotherapy is around 20% (Swift & Greenberg, 2012). Given the rising demand for mental health care services, it is also important to note that simply providing access to care may not mitigate the reported increases in pathology. It is essential that clients, patients, and consumers of mental and behavioral health care services have access to care that they view as being helpful to their functioning and that can provide them with skills applicable to other areas of their lives or future stressors; otherwise, there is a risk for attrition. Access to mental health care is necessary but not sufficient for improving broad mental health related outcomes. This study protocol may provide a feasible and well-received

Applications

Given the brief nature of the intervention and the ease of administration using trained researchers rather than professional or licensed mental health care workers, this intervention protocol could provide one potential alternative method of mental health and wellbeing support for college students. This could provide a source of relief for university counseling centers that are currently facing increased demand for services and have inadequate staffing or financial resources to support increased staff. The intervention was implemented by two trained

researchers currently pursuing master's degrees in psychology, rather than licensed mental or behavioral health providers, again supporting the efficacy and ease with which this intervention can be implemented.

This study has high versatility given the modifications and tailoring it allows for based upon participant characteristics, making it uniquely qualified to be applied across many different groups of people and settings. Intuitively, this protocol could be implemented with different types of student groups, such as master's or doctoral students, professional students (e.g., law), and medical students. Suicide is a leading cause of death among medical students and residents (Yaghmour et al., 2017), and it is recommended that medicine trainees are offered greater mental health support in order to mitigate such tragic and unnecessary deaths. However, it is often unclear how to provide effective mental health support; this protocol could offer one option.

Additionally, due to the nature of conducting research with current undergraduate students, it makes sense that our participants' goals largely related to their academic performance in some way. However, it is reasonable to assume that our protocol could be used to support students and non-students in the pursuit of goals related to their mental health, functioning, or well-being more broadly again by focusing on values-based behavior rather than symptom reduction (Hayes et al., 1999; Hayes et al., 2006). For example, an individual interested in focusing on depression symptoms may be able to quantifiably measure behavior change in units of minutes per day spent working on household chores, steps walked per day, or minutes per day spent outside the home.

Early intervention and prevention of psychological problems may also be attainable using this intervention. Given that the intervention allows participants to choose a target behavior to increase or decrease, it is unnecessary for participants to necessarily have a psychiatric diagnoses

or clinical presenting problem to benefit from this study. From a preventative viewpoint, individuals may benefit from using this protocol in a manner that helps them increase desirable behaviors in their lives, such as a mindfulness practice, exercise, time spent doing homework, community involvement, or activism. Not only would the intervention assist in increasing desirable target behaviors, it would teach skills and concepts related to Acceptance and Commitment Therapy processes, such as willingness and defusion, that would then be applicable to most or all external and internal situations someone may experience in their future. Feedback from current study participants suggests that they have gained applicable and useful skills that they plan to apply to a wide array of life situations.

Further, this protocol may be a useful intervention for people who are beginning to experience mild or moderate levels of psychopathology before symptoms exacerbate or become chronic. People cite various reasons for not seeking mental health support at the initial onset of their symptoms. In a review of the literature, the most frequently cited barriers to treatment across studies included stigma, lack of ability to identify and recognize symptoms that warrant treatment, and intentions to “power through” or overcome symptoms without professional help (Gulliver et al., 2010). This protocol may offer a middle ground for people who do not wish to begin individual therapy but who do need some sort of support to enhance their psychological wellbeing.

Conclusion

In a six-week intervention aimed at increasing undergraduate students’ psychological flexibility, emotion regulation, values-based behavior, and self-regulation, promising results were achieved. Two out of three participants intended to and reported significant decreases in

their target behavior; reported increases in psychological flexibility, emotion regulation, values-behavior coherence, college student wellbeing, and self-regulation; and reported that they benefited from the intervention, plan to utilize the tools they learned throughout the study in the future, and would recommend that friends or other students participant in this intervention. The intervention was feasible to implement with two trained research assistants who are currently pursuing master's degrees in psychology.

Directions for future research should include implementing similar treatment protocols with more diverse groups of participants. Despite the positive results achieved in this study, it was implemented within the specific context of a university setting. Further investigation is needed to determine whether similar protocols may be used in outpatient community mental health settings, with individuals presenting with clinical or diagnostic-level psychopathology, with non-college attending adults, and in group formats. Additionally, future research should consider a more longitudinal approach to data collection to assess the stability of improvements over time. Due to the nature of the study, we collected some level of participant treatment adherence via daily self-monitoring data. However, follow-up interviews or self-report questionnaires in the months following the intervention may provide greater insight into the long-term utility of it on participants' wellbeing.

The study provides exciting results in a time during which there is great demand for mental health care services yet inadequate treatment options to meet these needs. This protocol may provide an alternative treatment method to traditional outpatient individual therapy that is typically recommended as the first line of mental and behavioral health intervention for college students and adults similar to the population described in this study. This study provides evidence to suggest that psychological flexibility, emotion regulation, values-behavior

coherence, self-regulation, and college student wellbeing are malleable even in short periods of time. The large amount of time and financial resources needed to provide quality mental health care may be able to be reduced if further research also supports the use of brief, values-based interventions, such as the one implemented in this study.

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APPENDICES

Appendix A. Institutional Review Board Approval



To:
Dana Paliliunas
Psychology

RE: Notice of IRB Approval

Submission Type: Initial

Study #: IRB-FY2021-454

Study Title: Online Values-Based Self-Management Training for Undergraduate Students

Decision: Approved

Approval Date: February 24, 2021

This submission has been approved by the Missouri State University Institutional Review Board (IRB). You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented. Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB.

This study was reviewed in accordance with federal regulations governing human subjects research, including those found at 45 CFR 46 (Common Rule), 45 CFR 164 (HIPAA), 21 CFR 50 & 56 (FDA), and 40 CFR 26 (EPA), where applicable.

Researchers Associated with this Project:

PI: Dana Paliliunas

Co-PI:

Primary Contact: Dana Paliliunas

Other Investigators: Chynna Frizell, Baylor Miles, Crystal Tracy, Sara Johnson, Jessica Summers

Appendix B. Valued Action Training Interview Questions

1. Tell me a bit about yourself. (Including your major and why you are here at MSU).
2. What is the biggest challenge or problem you are experiencing in your life right now/Why did you decide to participate in this study?
3. How long have you been experiencing these challenges?
4. What is your goal in working with us?
5. What have you done to try to deal with your current problem?
6. What are your personal strengths?
7. Do you have any medical or physical conditions that are impacting the problem?
8. Do you work, and if so, how much?
9. What is your typical day like?
10. What is your living arrangement?
11. Who would you consider your support system, if you feel that you have one?
12. What behaviors do you think you engage in too much or not enough that are causing or contributing to your problem? Which behavior is the biggest problem?
13. Think about that most problematic behavior...
 - a. What typically happens when you engage in this behavior? What is the outcome, good or bad?
 - b. Why do you engage in this behavior?
14. When you think about your struggles and these behaviors, what sort of thoughts, emotions, or memories do you have?
15. Which of these thoughts, emotions, or memories would you block out or get rid of if you could?
16. What do you normally do to deal with these thoughts, feelings, and memories when they come up?
 - a. Do you avoid any particular activities, situations, or people?
 - b. Do you try to distract yourself, numb yourself, “get away from it” somehow?
17. How do these behaviors pay off for you? What do you get out of doing these things?
18. What are you losing out of because of this struggle?
19. What barriers do you foresee in overcoming this struggle?

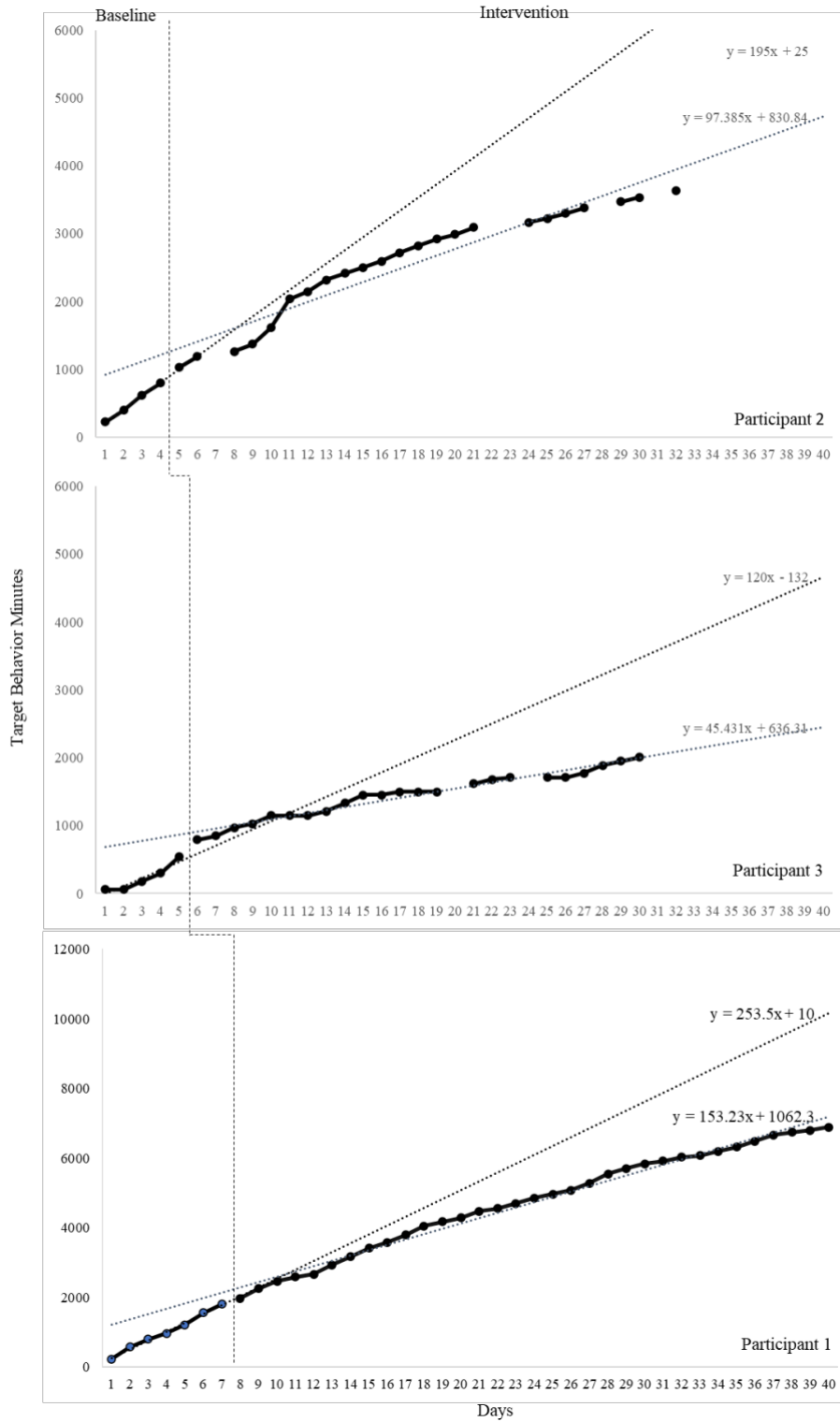
Appendix C. Values and Goal Setting Workbook Exercises

1: Clarify Values	<ul style="list-style-type: none">• Introduction to Values-Driven Behavior (adapted from Hayes & Smith, 2005)• Values Assessment Rating Form (Harris, 2008)• Relating Values to Education
2: Consider Contingencies	<ul style="list-style-type: none">• Identify Competing Contingencies• Identify Valued Outcomes• Identify Rewards and Reinforcers
3: Consider Cognitions	<ul style="list-style-type: none">• Suffering is Universal Introduction (Hayes & Smith, 2005, p. 10-11)• Suffering Inventory (Hayes & Smith, 2005)• Costs of Avoidance (Harris, 2008)
4: Consider Context	<ul style="list-style-type: none">• Review and Brainstorm Self-Management Techniques: (Miltenberger, 2016)• Antecedent Manipulations• Consequence Manipulations• Social Support• Skills Training
5: Commit to Behavior Change	<ul style="list-style-type: none">• Introduction to Committed Action (Hayes & Smith, 2005, p. 177-178)• Willingness and Action Self-Management Plan (adapted from Harris, 2008)• Goal Setting• Willingness for Private Events• Self-Management Plan• Self-Monitoring System• Committed Actions

Appendix D. ACT Session Exercises

Session	Exercises
1	Be Where You Are Mindfulness Exercise (p. 107-108) Avoidance and Willingness Exercises Hungry Tiger Metaphor Why Willingness Exercise
2	Mindfulness of Breath Exercise (Harris, 2008, p. 17) Willingness and Defusion Exercises Physicalizing Activity The Mind Train Exercise
3	Inner-Outer Experience Mindfulness Exercise (McKay et al., 2007, p. 71-72) Defusion Exercises Hooks and the Problem with Control Efforts (Polk et al., 2016, p. 65-76) Leaves on a Stream Exercise
4	Be Where You Are Mindfulness Exercise (p. 107-108) Self-as-Context and Committed Action Exercises Three Senses of Self Chess Board Metaphor Values Form (p. 186)

Appendix E. Cumulative Self-Monitoring Data



Appendix G. Multiple-baseline across participants for cumulative self-monitoring data. Trend lines represent linear regressions fit to baseline and intervention data.

Appendix F. Participant Self-Report Scores

Measure		Baseline	Post-Intervention	Change
AAQ-II				
Total Score	P1	23	21	-2*
	P2	28	21	-7*
	P3	33	22	-11*
CSSWQ				
Total Score	P1	82	97	+15*
	P2	86	106	+20*
	P3	64	87	+23*
Academic Satisfaction				
	P1	21	24	+3*
	P2	21	27	+6*
	P3	11	20	+9*
Academic Efficacy				
	P1	22	24	+2*
	P2	17	25	+8*
	P3	15	21	+6*
School Connectedness				
	P1	17	21	+4*
	P2	23	26	+3*
	P3	15	22	+7*
College Gratitude				
	P1	22	28	+6*
	P2	25	28	+3*
	P3	23	24	+1*

DERS-18

Total Score	P1	69	36	-33*
	P2	43	28	-15*
	P3	68	30	-38*
Awareness				
	P1	12	8	-4*
	P2	10	5	-5*
	P3	10	7	-3*
Clarity				
	P1	12	7	-5*
	P2	5	4	-1*
	P3	8	5	-3*
Goals				
	P1	13	6	-7*
	P2	8	6	-2*
	P3	15	6	-9*
Impulse				
	P1	9	4	-5*
	P2	3	3	0
	P3	9	3	-6*
Nonacceptance				
	P1	11	7	-4*
	P2	12	6	-6*
	P3	14	5	-9*
Strategies				
	P1	12	4	-8*
	P2	5	4	-1*
	P3	12	4	-8*

SSRQ

Total Score	P1	106	122	+16*
	P2	76	117	+41*

	P3	89	128	+39*
PSS				
Total Score	P1	22	20	-2*
	P2	24	26	+2
	P3	29	21	-8*
CompACT				
Total Score	P1	65	96	+31*
	P2	47	116	+69*
	P3	65	99	+34*
Openness to Experience				
	P1	21	32	+11*
	P2	16	48	+32*
	P3	21	38	+17*
Behavioral Awareness				
	P1	14	23	+9*
	P2	12	27	+15*
	P3	9	19	+10*
Valued Action				
	P1	30	41	+11*
	P2	19	41	+22*
	P3	35	42	+7*
VBCQ				
Total Score	P1	15	26	+11*
	P2	23	26	+3*
	P3	19	29	+10*

* Indicates change in the therapeutic direction.

Appendix G. Social Validity Responses

Question	Participant 1	Participant 2	Participant 3
I have personally benefited greatly from this experience	Strongly Agree	Strongly Agree	Strongly Agree
I will be utilizing the tools provided by this experience for future goals and challenges	Strongly Agree	Strongly Agree	Strongly Agree
I would recommend this experience to a friend or other student in college.	Strongly Agree	Strongly Agree	Strongly Agree
What was the most positive part of this experience for you?	<i>“I successfully decreased my target behavior from the intervention to a much greater degree than I had anticipated.”</i>	<i>“The most positive part of this experience for me was learning how to accept certain thoughts and feelings by acknowledging their existence but not letting myself get carried away by them.”</i>	<i>“The mindfulness activities.”</i>
What was the most negative part of this experience for you, and what would you have improved?	<i>“I wish I had been able to do this in person rather than online, but I understand that with the pandemic this was the better option. I think it would have been even more beneficial (more immersive, less internet issues) if it had been in person.”</i>	<i>“I don’t feel as though there were any negative parts, nor can I think of a way in which to improve this experience.”</i>	<i>“Trying to stay on track with my action plans during the week.”</i>