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A brief acceptance and commitment therapy based intervention for distressed graduate students

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A Brief Acceptance and Commitment Therapy Based Intervention for Distressed Graduate Students

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ABSTRACT

Graduate students report to experience distress at high rates. Research suggests that self-care behaviors such as sleep, exercise, and mindfulness practice can helpful for mental health and wellbeing. The current study examined the effectiveness of a brief Acceptance and Commitment Therapy (ACT) based intervention on increasing self-care behaviors in distressed graduate students at the University of Mississippi (N=7). The intervention was delivered in three 60-minute individual sessions. The effects of the intervention were examined using a concurrent multiple baseline across participants design. Results indicated that five out of seven participants showed increases in self-reported self-care behaviors after the start of the intervention, and three maintained their gains in the post-intervention period. Implications of these findings for distressed graduate students are discussed.

DEDICATION

To the members of my lab, especially my advisor Kelly Wilson. Thank you for the guidance and for believing in me. This is also dedicated to distressed graduate students everywhere.

LIST OF ABBREVIATIONS

DASS-21	Depression, Anxiety and Stress Scales—21
SCQ	Self-Care Questionnaire

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I. INTRODUCTION

Graduate Student Mental Health Difficulties

While graduate school can be a rewarding experience, graduate students face unique stressors. In comparison to undergraduate education, graduate school has a less formal structure and higher academic demands, which requires more self-motivation (McKinzie, Altamura, Burgoon, & Bishop, 2006). Graduate students must balance multiple demands at the same time, such as research, teaching, and publishing. Additionally, graduate school represents a departure from the normal progression through adulthood and offers little financial support (McKinzie et al., 2006). While graduate school is meant to present novel intellectual challenges, it can also be personally difficult for students.

Considering the unique demands of graduate school, it's not surprising that graduate students tend to report that stress impairs their functioning (El-Ghoroury, 2011; Myers et al., 2012). Studies have also found high rates of anxiety and depression among graduate students (Heins, Fahey, & Leiden, 1984; Stecker, 2004; Vitaliano, Maiuro, Mitchell, & Russo, 1989). In one cross-sectional study, nearly 70 percent of a large sample of graduate students endorsed at least mild levels of depression (Garcia-Williams, Moffitt, & Kaslow, 2014). According to Badali and Habra (2003), graduate students are vulnerable to distress for many reasons, including performance anxiety, competition, lack of experience, demands of the institution, and tension in personal and professional relationships. If left untreated, mental health difficulties can result in

an increased probability of graduate student dropout (Turner & Berry, 2000; Wilson, Mason, & Ewing, 1997). More seriously, graduate students who report elevated levels of anxiety and depression are more likely to report engaging in suicidal behavior (Garcia-Williams et al., 2014). In general, the rates of depression and suicide are higher among graduate students compared to the general population (Mosley et al., 1994). One way to address the mental health difficulties faced by graduate students is to increase their self-care behaviors.

Self-Care Practice & Mental Health

Self-care involves behaviors that promote and maintain physical and emotional wellbeing, such as sleep, exercise, social support, and mindfulness (Myers et al., 2012). Little research has examined self-care behaviors among graduate students, but the existing research indicates that graduate students are particularly vulnerable to negative physical and mental health effects that go along with high levels of distress (Schwartz-Mette, 2009). Melnyk et al. (2016) gave 93 first-year health sciences graduate students measures assessing their physical health, lifestyle beliefs, self-care behaviors, and mental health. Their findings indicated that 41 percent reported heightened depressive symptoms, 28 percent reported elevated anxiety symptoms, and four students reported suicidal ideation. Furthermore, 40 percent were either overweight or obese and 19 percent had elevated cholesterol levels. Only 44 percent indicated that they exercised at least 30 minutes five days per week, and only 32 percent reported eating at least five fruits and vegetables each day. Importantly, anxiety and depression were significantly negatively correlated with healthy lifestyle beliefs and behaviors, indicating that as depressive and anxiety symptoms increased, healthy behaviors decreased (Melnyk et al., 2016). Overall, these various self-care deficits were associated with students' diminished well-being.

Below are some specific elements of self-care that have been shown to be beneficial for wellbeing in the general population as reported by Myers et al. (2012).

Sleep.

The importance of sleep for physical and mental health is well documented. Sleep quality and duration have positive benefits for physical health (Itani, Jike, Watanabe, & Kaneita, 2017), stress (Mezick et al., 2009; Mullan, 2014), and fatigue (Waters, Naik, & Rock, 2013). With regard to mental health, sleep quality is important for a wide range of disturbances, including anxiety, depression, eating disorders, personality disorders, and psychotic disorders such as schizophrenia (Baglioni et al., 2016). The National Sleep Foundation recommends that adolescents and adults give themselves seven to nine hours of sleep opportunity each night (Buman, Phillips, Youngstedt, Kline, & Hirshkowitz, 2014). Sleep opportunity can be defined as the number of hours one gives oneself for sleeping each night (i.e. the number of hours that they are lying down with the goal of sleeping).

In a recent survey assessing graduate student well-being, Panger, Tryon, & Smith (2014) found that inadequate sleep was the top predictor of depression among graduate students. Several studies have suggested that graduate students who have poor sleep quality tend to report more negative affect and higher levels of stress (Insel & Roth, 1991; McKinzie et al., 2006; Myers et al., 2012). Research has suggested that graduate students with poor sleep quality are more likely to perceive their health as poor (Pallos, Gergely, Yamada, Miyazaki, & Okawa, 2007) and to report experiencing interpersonal conflicts (Baldwin & Daugherty, 2004). In a national survey, Oswalt & Wyatt (2015) examined the sleep habits of graduate students and found that their sleep patterns were generally poor, concluding that graduate students could benefit from sleep

interventions. These findings suggest that sleep quality and duration could have a large impact on the mental health of graduate students.

Exercise.

The benefits of exercise for physical health are well established. Exercise improves outcomes in patients with a wide variety of physical problems including chronic heart failure (Gu et al., 2017), coronary heart disease (Anderson et al., 2016), and Parkinson's disease (Shu et al., 2014). In recent years, there has been an increase in evidence showing that exercise also has a positive effect on mental health and wellbeing (Schulz, Meyer, & Langguth, 2012) and improves outcomes in individuals experiencing difficulties with depression (Kvam, Kleppe, Nordhus, & Hovland, 2016) and anxiety (Stubbs et al., 2017). Exercise has also been linked to reduced stress (Gerber et al., 2014; Wang et al., 2014a).

There is little research assessing the exercise habits of graduate students, but we can draw from research on medical students and undergraduate students. Two studies found a link between exercise habits and stress such that medical students who exercised regularly reported experiencing less stress (Frank, Tong, Lobelo, Carrera, & Duperly, 2008; Sheetsa, Gorenfloa, & Forneyb, 1993). A study done with Chinese undergraduates studying in the United States found that exercising infrequently was associated with higher rates of anxiety and depression (Han, Han, Luo, Jacobs, & Jean-Baptiste, 2013). These studies are correlational and cross-sectional, so there is a need for well-controlled time series research. However, given the results from these studies, it is likely that regular exercise would improve the mental health of graduate students.

Mindfulness Practice.

Mindfulness practice can be defined as engaging in behaviors aimed at increasing nonjudgmental, present-moment awareness and acceptance (Bishop et al., 2004). Research has

suggested that mindfulness-based interventions are effective for reducing stress (Burton, Burgess, Dean, Koutsopoulou, & Hugh-Jones, 2016; Chiesa & Serretti, 2009; Shapiro, Brown, & Biegel, 2007), increasing quality of life (Brown & Ryan, 2003), and decreasing anxiety and depression (Vøllestad, Nielsen, & Nielsen, 2012; Goldin & Gross, 2010).

Studies show that teaching mindfulness skills to graduate students leads to positive differences in stress (Tarrasch, 2015), anxiety (Barbosa et al., 2013), and social connectedness (Cohen & Miller, 2009). Judging from this research, it is likely that mindfulness practice would be beneficial for distressed graduate students.

Diet.

A low-quality diet, characterized by less fruits and vegetables and more processed foods and sugar, is related to anxiety, depression, and stress, per Davison & Kaplan, 2012. Recent studies also indicate that a healthy diet is a protective factor against depression (Sanchez-Villegas et al., 2009) and that improving nutritional habits can lead to better mental health outcomes (Aucoin & Bhardwaj, 2016). A recent meta-analysis (Opie, O'Neil, Itsiopoulos, & Jacka, 2015) indicates that a diet rich in fruits, vegetables, nuts, olive oil, fish, and legumes serves as a protective factor against depression. Research also points to a link between depression and a diet high in refined grains and sweets (Haghighatdoost et al., 2016).

Very few studies have looked at the relation between eating behaviors and mental health in students. One study conducted by Ogden and Mtandabari (1997) found that medical students who report being less stressed tend to eat healthy snacks (e.g. fruits and vegetables) while those who report being more stressed tend to have less healthy eating habits (e.g. sodas, potato chips, candy). Research on college students indicates that students who report higher levels of stress are more likely to eat unhealthy foods (El Ansari, Adetunji, & Oskrochi, 2014; Papier, Ahmed, Lee,

& Wiseman, 2015). Given the existing research on nutrition and mental health, it is likely that graduate students would benefit from developing healthy eating patterns.

Social Support.

The evidence is mounting that engaging in activities that promote positive social support may be important for wellbeing and serve as a buffer against anxiety and depression (Carpenter et al., 2015; Hostinar & Gunnar, 2015; Semerci, 2016; Wang, Cai, Qian, & Peng, 2014b). Individuals who report having more social support in their lives tend to report experiencing less stress (Lee & Goldstein, 2016), less anxiety (Lilympaki et al., 2016), fewer depressive symptoms (Leahy-Warren, McCarthy, & Corcoran, 2012), and a higher quality of life (Kroenke et al., 2013).

Among graduate students, social support appears to be important for wellbeing. One study indicated that social support was inversely related to anxiety among female graduate students (Munir & Jackson, 1997). Several studies have found that graduate students who report receiving more support from their advisor, peers, friends, and family also report lower levels of stress (Clark, Murdock, & Koetting, 2009). This research supports the idea that social support is important for mental health among graduate students.

Acceptance and Commitment Therapy/Training

An intervention that sets the stage for engaging in self-care behaviors is Acceptance and Commitment Therapy or Acceptance and Commitment Training in non-therapy contexts (ACT; Hayes, Strosahl, & Wilson, 2011). ACT focuses on increasing psychological flexibility, which is the ability to engage in values-based behavior regardless of one's inner experiences. In other words, rather than attempting to decrease unwanted symptoms such as anxiety and depression, ACT therapists focus on changing the way that people relate to their unwanted inner experiences

(i.e. changing the function of these inner experiences), as well as on increasing meaningful behavior based on the person's values.

Research has shown that ACT is an effective intervention for a wide range of difficulties, including stress (Brinkborg, Michanek, Hesser, & Berglund, 2011; Datta, Aditya, Chakraborty, Das, & Mukhopadhyay, 2016), anxiety (Arch et al., 2012; Dalrymple & Herbert, 2007), and depression (Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Najvani, Neshatdoost, Abedi, & Mokarian, 2015; Walser et al., 2015). ACT interventions have also been shown to improve wellbeing in patients with diabetes (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007), cancer (Feros, Lane, Ciarrochi, & Blackledge, 2013), and chronic pain (Trompetter, Bohlmeijer, Veehof, & Schreurs, 2015).

ACT has also been effective in many non-therapy trials, including improving singing confidence in early childhood teachers (Swain & Bodkin-Allen, 2017) and increasing physical activity in adults (Ivanova, Yaakoba-Zohar, Jensen, Cassoff, & Knäuper, 2016; Ivanova, Jensen, Cassoff, Gu, & Knäuper, 2015; Kangasniemi, Lappalainen, Kankaanpaa, Tolvanen, & Tammelin, 2015; Moffitt & Mohr, 2015). However, research has yet to examine whether an ACT intervention focused on self-care is effective for distressed graduate students.

ACT Processes and Self-care.

ACT targets six processes: acceptance, cognitive defusion, self as context, mindfulness, values, and committed action (Hayes et al., 2011). Each process offers ingredients that could be beneficial for addressing self-care with graduate students. Below, we describe the ACT processes in terms of how each one might be used in an intervention.

Acceptance.

Acceptance involves a willingness to feel one's inner experience, even when that

experience is unwanted or distressing, without trying to escape or avoid it. This could be particularly useful for lifestyle changes such as exercise. For example, a graduate student might avoid exercising due to the unpleasant physical sensations that could arise (e.g. increased heartrate, sore muscles, shortness of breath). Perhaps this person values being healthy, but worries that they will feel discomfort if they exercise. Teaching acceptance skills might increase their willingness to experience some unpleasant feelings in service of what they care about (i.e. being healthy).

***Cognitive defusion*.**

Cognitive defusion refers to altering the function of painful thoughts and thereby decreasing the power of these thoughts over the individual. Oftentimes, graduate students (and humans in general) carry stories about themselves that they believe are literal truths, which keep them from engaging in healthy lifestyle changes. Continuing with the example above, a person who doesn't exercise may have thoughts about their character (e.g. "I'm lazy") and what they can or can't accomplish (e.g. "I'll never be able to be fit, so why bother trying?") that they believe to be true. The goal of teaching defusion techniques would be to help them create distance between themselves and their thoughts, so that they begin to form a new relationship with their thoughts such that their thoughts don't have as much power over them. In essence, defusion helps people experience their thoughts as just what they are: thoughts that come and go, much like the weather, as opposed to facts. Once people realize that their thoughts don't have to control their behavior, they are free to do what they want, regardless of what their thoughts tell them to do. In other words, defusion is a technique used to change the function of thoughts in order to promote psychological flexibility (Luoma & Hayes, 2009).

Control-based strategies, such as avoidance and thought suppression, can be explained as

the opposite of acceptance and defusion (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). There is a growing evidence base indicating that these strategies are ineffective and, in some cases, damaging for psychological health (Levitt, Brown, Orsillo, & Barlow, 2004; Marcks & Woods, 2005). Conversely, studies have suggested that defusion techniques can have positive effects on mental health (Healy et al., 2008; Masuda, Hayes, Sackett, & Twohig, 2004) and can increase willingness to engage in physical activity (Ivanova et al., 2016).

Self as context.

Self as context involves experiencing oneself as the context within which feelings and thoughts occur, as opposed to overly identifying with them or attaching to them. An important piece of self-as-context is perspective taking, or being able to step outside of the content of one's self-identity and experience the self as an ongoing process that changes and evolves over time. Cultivating perspective taking can help foster a sense of self-compassion, which can be very helpful when it comes to making lifestyle changes. For example, the graduate student who is thinking about beginning to exercise might feel held back by stories about their self-identity (e.g. "I don't exercise"). During an intervention, we might invite that person to imagine their face when they were a child, and to ask themselves when it became acceptable to neglect caring for that child. We might ask them what they could give that child as an act of kindness. Perhaps they'd like to take the child out for a walk, a swim, or a run. We might then gently invite them to orient that kindness towards themselves as they are now. This type of shift in perspective is like a muscle that can be strengthened over time through practice.

Present Moment.

Present moment processes involve being in contact with the present moment and noticing one's experiences non-judgmentally. Present moment processes involve the use of mindfulness

in a variety of ways. As mentioned earlier, teaching mindfulness skills has been shown to be enormously helpful for a wide variety of difficulties such as stress, anxiety, and depression (Burton et al., 2016). In ACT, present moment processes are often woven into many different parts of training and include various strategies for bringing mindful attention to the present moment. With regard to lifestyle changes, many individuals feel anxious at the prospect of beginning an exercise routine, changing their diet, or initiating more social contact. In ACT, we might gently direct them to bring their attention back to the rise and fall of their breath, or invite them to describe the physical sensations that they feel in their body. An ACT trainer might also use pace to cultivate more mindfulness by slowing down his/her speech or asking the individual to repeat a thought slowly. The goal of these techniques would be to orient the person to their present moment experiences in a non-judgmental way, without trying to change them.

Values.

Values are the areas of life that one considers important and meaningful. In ACT, substantial time is often devoted to cultivating values. Common values among individuals include family, friends, and spirituality. When considering what lifestyle changes to make, it can be helpful to link specific behaviors to the person's most important values. For example, an individual might consider their most important values to be health, family, and friends. When exploring targets for behavior change in the category of "health," the client might include exercise and improving nutrition. However, these lifestyle changes would also relate to their values of being a good family member and friend. Let's say this person has a son, and wants to be around to meet his son's children at some point. Exercising regularly and eating nutritious food would make it more likely that he would live a long, healthy life that would include meeting his grandchildren someday – in other words, these behaviors would directly feed into his value of

family in addition to health. Connecting lifestyle changes explicitly to each person's values can help change the function of these behaviors for the individual, making them more reinforcing (Chase et al., 2013).

Committed Action.

Committed action involves engaging in behavior that moves one towards their values. When it comes to making lifestyle changes, committed action involves cultivating small practices that help bring the person in line with their values. Changes like this might include walking for 10 minutes in the afternoons, giving oneself an extra hour of sleep opportunity each night, or adding in a serving of vegetables to dinner. Inevitably, people are not likely to be 100% in line with their values at all times. Thus, a key part of the practice is noticing when a lapse occurs and gently returning to the valued pattern of action. Making lifestyle changes can be overwhelming, and oftentimes people go overboard trying to make too many changes at once. Thus, it's important that committed action targets are small and readily accomplished. The key is to create a pattern of habitual action that is sustainable.

The Present Study

This study examined the efficacy of a brief three-meeting ACT training focused on self-care in distressed graduate students. It is not designed to treat disorders, but rather to assist graduate students who are experiencing distress and who show some deficits in self-care. We predicted that the intervention would increase self-care behaviors among the participants. We also predicted that the intervention would result in a decrease in psychological distress as a byproduct of increased self-care behaviors.

II. METHODS

Participants

Participants were recruited through campus e-mail announcements sent out to graduate students who were currently enrolled at the University of Mississippi. The e-mails asked for volunteers who were experiencing stress and were interested in improving their self-care habits. All participants owned iPhones and were willing to use them to answer a set of questions each day about their lifestyle.

Participants interested in the study were directed to an online screener assessing self-care behavior and level of distress. Though this study is not designed to treat disorders, it is designed to intervene on psychological distress. The DASS-21 considers the cutoff scores for mild symptoms to be ten for depression, eight for anxiety, and 15 for stress. Therefore, in order to be eligible to participate in the study, participants were required to meet or exceed one of these cutoff scores at screening. We also screened for participants' average amount of sleep opportunity, exercise, and mindfulness practice over the last week. In order to participate in the study, participants were required to report that they engaged in lower than the recommended amounts of at least one of these self-care behaviors over the last week. The screener also communicated that participants must be willing to participate in three one-hour meetings intended to enhance self-care behaviors.

Measuring Self-Care Behaviors

Exercise.

The World Health Organization recommends that adults ages 18-64 get at least 150 minutes of moderate-intensity physical activity (e.g. walking, jogging, biking, swimming, etc.) each week (WHO, 2011). Those participating in the study who chose exercise as their idiographic dependent variable reported that they engaged in less than 150 minutes of moderate-intensity physical activity over the last week.

Sleep Opportunity.

The National Sleep Foundation recommends that adults get 7-9 hours of sleep each night (Knutson et al., 2017). Those participating in the study who chose sleep opportunity as their idiographic dependent variable reported that they engaged in an average of less than 7 hours of sleep opportunity each night over the past week.

Mindfulness practice.

The authors of the Mindfulness-Based Stress Reduction program recommend at least 45 minutes of formal mindfulness practice 6 days per week (Santorelli, 2014). In order to adapt this recommendation to the study population, we lowered this requirement to 30 minutes at least three days per week. Those participating in the study who chose mindfulness practice as their idiographic dependent variable reported that they did not have a regular mindfulness practice where they practiced for 30 minutes at least three days per week.

Measures

Demographics.

Participants were asked to answer a set of general demographics questions about their age, gender, and ethnicity. For the question about gender, participants were asked to select one of

the following options: male, female, or other. For the question about ethnicity, participants were given the option to select one or more of the following options: Caucasian, African American, Asian American, Hispanic/Latino, Native American, Pacific Islander, and Other.

Self-Care Questionnaire (SCQ).

The SCQ is a three-item measure designed by the author and administered electronically during screening and at follow-up. Participants were asked to report their daily average of sleep opportunity, exercise, and mindfulness practice over the past week.

Below are the questions that were asked:

- Sleep: "On average, how many hours of sleep opportunity did you give yourself each night over the past week? Sleep opportunity is the number of hours you gave yourself for sleeping each night (i.e. the number of hours you were lying down with the goal of sleeping)." This question was answered using a dropdown list of answer options from 0-14 hours, in increments of 30 minutes.
- Exercise: "On average, how many minutes did you spend exercising each day over the past week? Examples of exercise include walking, jogging, biking, swimming, etc." This question was answered using a dropdown list of answer options from 0-200 minutes, in increments of 5 minutes.
- Mindfulness: "Over the last week, did you engage in regular mindfulness practice where you practiced for at least three days for 30 minutes each time? Examples include meditation and yoga." This question had two answer options: "yes" or "no."

Tracking Self-Care Behaviors.

Throughout the study, we tracked each participant's daily level of engagement in five behaviors related to self-care: sleep opportunity, exercise, mindfulness practice, diet, and

meaningful social activity. While it would have been ideal to measure all five of these behaviors using precise data collection methods (i.e. iPhone apps), asking the participants to do this with all five behaviors would have been burdensome. Therefore, we requested that participants only monitor one of these behaviors with precise methods (iPhone apps) and we used less precise methods (daily diary monitoring) to track all five behaviors.

iPhone App Monitoring.

Participants were asked to choose exercise, sleep, or mindfulness practice as their idiographic dependent variable, which was monitored using iPhone apps and served as the main dependent variable of the study. The idiographic dependent variables were restricted to exercise, mindfulness practice, and sleep opportunity because these areas of behavior are easy to track with iPhone apps designed to measure these behaviors. For example, it is very straightforward for participants to track and report the number of minutes they spend engaging in exercise. It is less straightforward to track diet and meaningful social activity. However, we still requested that participants track these less easily quantifiable areas (diet and meaningful social activity) throughout the study by answering the daily diary questions. We hypothesized that many of these self-care variables would vary together.

The following apps were used to track each participant's idiographic dependent variable:

Exercise. Runkeeper is an app that tracks the amount of time spent engaging in a wide variety of exercises, including running, walking, hiking, cycling, and more. Participants who chose exercise as their idiographic dependent variable were asked to track the number of minutes they spent exercising each day.

Sleep. Sleep Cycle is an app used to track and measure sleep quality and duration. Participants who chose sleep as their idiographic dependent variable were asked to track the number of hours of sleep opportunity they gave themselves each night.

Mindfulness. Insight Timer is an app that tracks meditation and mindfulness practice. Participants who chose mindfulness as their idiographic dependent variable were asked to track the number of minutes they spent engaging in mindfulness practice each day.

Daily Diary Monitoring.

During baseline and the intervention, participants reported their daily level of engagement in several behaviors related to self-care including sleep opportunity, exercise, mindfulness practice, diet, and meaningful social activity. This data was collected using daily-diary methods (Miller, 2012). Specifically, participants were e-mailed a link to a set of survey questions. They were asked to access this survey every day during the study period. Each area of self-care was measured with a single question. Anchors were provided to guide the participants in answering these questions. The question on mindfulness practice was adapted from the Daily Mindful Responding Scale (DMRS; Lacaille, Sadikaj, Nishioka, Flanders, & Knäuper, 2015). The item was chosen based on the fact that it had the highest loading on the mindfulness factor in a factor analysis conducted by Lacaille et al. (2015). The item was slightly modified from its original version to fit the purposes of the current study.

Below are the questions for each area of self-care:

- Exercise: “How many minutes did you spend exercising today?” This question was answered using a dropdown list of answer options from 0-200 minutes, in increments of 5 minutes.

- Mindfulness practice: “Today, when I was absorbed in thoughts or emotions, I "stepped back" from them so that I could see them more clearly, without being drawn into them.” This question was answered on a scale of 1 (rarely) to 10 (often).
- Sleep: “How many hours of sleep opportunity did you give yourself last night?” This question was answered using a dropdown list of answer options from 0-14 hours, in increments of 30 minutes.
- Diet: “On a scale of 1 to 5, how would you rate your diet today? 1=mostly fast food and highly processed foods, 5=mostly whole and unprocessed foods.”
- Social Activity: “How many meaningful social interactions did you have today?” This question was answered using a dropdown list of answer options from 0-25, in increments of one.

The Depression, Anxiety, and Stress Scales—21.

The *Depression and Anxiety Stress Scales-21* (DASS-21; Lovibond & Lovibond, 1995) is a 21-item version of the 42-item self-report measure of depression, anxiety, and stress. The items are scored on a 4-point scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Example questions include: “I felt down-hearted and blue” and “I felt that I was using a lot of nervous energy.” This measure demonstrated excellent internal consistency for the Total Scale ($\alpha = .93$) and good to excellent internal consistency for the Depression ($\alpha = .94$), Anxiety ($\alpha = .87$), and Stress ($\alpha = .91$) subscales (Antony, Bieling, Cox, Enns, & Swinson, 1998).

The DASS-21 was e-mailed to participants for them to fill out electronically once per week for the duration of the study.

Procedure

This study utilized a concurrent, multiple-baseline, across participants design (Hayes, Barlow, & Nelson-Gray, 1999). Participants were graduate student volunteers currently enrolled at the University of Mississippi who were recruited through campus e-mail announcements. The study took place at the Psychological Services Center (PSC) on the University of Mississippi campus. The e-mail directed interested participants to fill out an online screening questionnaire to determine if they were eligible to participate in the study. Participants who did not meet inclusion criteria were informed of local resources for other mental health services available to them (i.e. therapy and counseling services on campus and in town). Eligible participants were invited to come to the PSC for an initial meeting. We recruited seven participants for the study.

During the initial meeting, each participant filled out the Demographics questions and the DASS-21. They were informed of the research design and told to start monitoring their self-care behaviors during baseline. We provided education regarding what constitutes each area of self-care and how to monitor self-care behaviors. Participants were invited to ask questions they had during this initial meeting. We told participants that they would not be informed of the exact amount of time that they would be in baseline, and that they would be contacted when it is time to schedule the first meeting. The baseline period for each participant began concurrently (i.e. all seven started during the same 3-day block of time). Throughout the baseline period, participants e-mailed their data from their iPhone apps on their idiographic dependent variable to the principal investigator each week. Once stable levels of baseline were reached for one participant, we contacted that participant to schedule the intervention. We first initiated the intervention with the focal participant who showed the most consistency in trend level and the least variability. For each remaining participant, the intervention began after the previous participant showed an

improvement in their reported idiographic self-care behavior. We looked for improvement across at least three data points.

Intervention

The intervention consisted of three one-hour meetings of Acceptance and Commitment Training (see appendix for detailed description of each meeting). With the exception of one participant who was out of town for one week between the second and third meetings, all participants had their three meetings take place within a two-week period of time, with three or four days between each meeting.

Meeting 1.

The first meeting targeted values and committed action linked to self-care. First, we used the Matrix (Polk & Schoendorff, 2014) interview to identify each participant's unwanted private experiences, coping strategies, most strongly held values, and specific behavioral targets related to self-care. Second, participants identified small practices related to their self-care area of focus, and they committed to engaging in these areas between the first and second meetings.

Meeting 2.

The second meeting targeted mindfulness, self-compassion, and perspective taking. Participants were invited to engage in a general mindfulness practice followed by a perspective-taking exercise designed to facilitate self-compassion. Committed action targets related to each participant's idiographic dependent variable were modified as needed.

Meeting 3.

The third meeting targeted acceptance and defusion. Participants were guided through an exercise designed to facilitate defusion practice (see "Leaves on a Stream" in appendix).

Participants were then oriented back to their values, and asked to recommit to self-care practice by identifying specific goals to start practicing regularly.

After the third meeting, participants continued to monitor their self-care behaviors for two more weeks. One month after their last meeting, they filled out follow-up questionnaires (SCQ and DASS-21).

III. RESULTS

Participants

Seven students (five female, two male) completed the intervention. Participants ranged in age from 22 to 38. The participants were allowed to choose more than one ethnicity, and six identified as Caucasian while one identified as Other Ethnicity. Four participants identified as being single, while three reported being married. Participants' current year in graduate school ranged from first to third (see Table 1 in appendix). All participant names in this document are pseudonyms.

Participant 1: Matt.

General description of course of intervention.

In session, Matt reported that his values include relationships with others (i.e. wife, friends, family, pet), art, nature, and spirituality. In the initial meeting, he indicated that he already engaged regularly in several self-care behaviors related to his values, such as hiking, reading/writing, biking, and walking his dog with his wife.

During the first meeting of the intervention, Matt stated that he struggled generally with thoughts about not being good enough (e.g. "is my work any good?", "I should be doing something, but I'm not sure what"), feelings of insecurity related to his body image, and uncomfortable physical sensations such as chest pain/tightness. Matt engaged in active patterns of avoidance, such as drinking and pacing around the house, and passive methods of avoidance including postponing administrative tasks and paper submissions. He stated that he desired to

take on new projects and develop new hobbies (e.g. learning Spanish, writing music) but felt held back by worries that he wouldn't be good at these things (i.e. "I don't want to do things I'm not good at").

Selecting idiographic self-care target and linking to values.

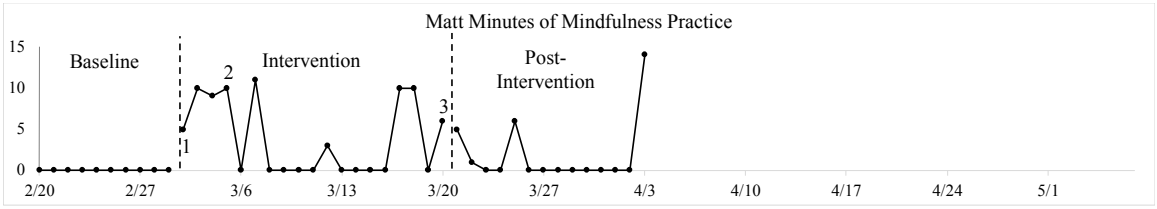
Matt reported that he had an interest in practicing mindfulness but had never done so, and thus chose mindfulness practice as his idiographic dependent variable for the study. He stated that he wanted to engage in mindfulness practice because he believed that it would be helpful for his interpersonal relations with others. He also indicated that mindfulness practice would be helpful for his engagement with nature and spirituality. He set his committed action target to practice for at least 10 minutes per day, 4-5 times a week.

Data analysis: idiographic dependent variable.

During the baseline period, Matt did not engage in any mindfulness practice. Upon beginning the intervention, Matt showed an immediate increase in the amount of time he spent practicing mindfulness. For the first week of the intervention, during which meetings 1 and 2 took place, Matt came very close to meeting his practice goal by practicing for at least 10 minutes on 3 out of 7 days. However, during the second week, Matt went out of town for spring break and only practiced once for 3 minutes during his trip—hitting his behavioral target on 0 of 7 days. When Matt returned from his trip, there were 5 days remaining in the intervention period, during which he met his practice goal on 2 out of 5 days by practicing for 10 minutes on each of the two days.

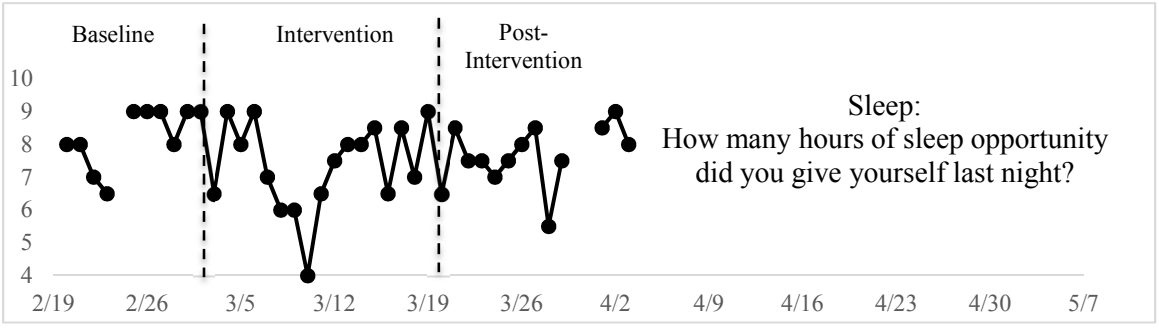
During our third meeting, Matt reported that he drank a lot of alcohol while he was away for spring break and said that he did not feel like practicing mindfulness during his trip. Matt stated that he struggled with feeling like a "failure" because he neglected to practice while he

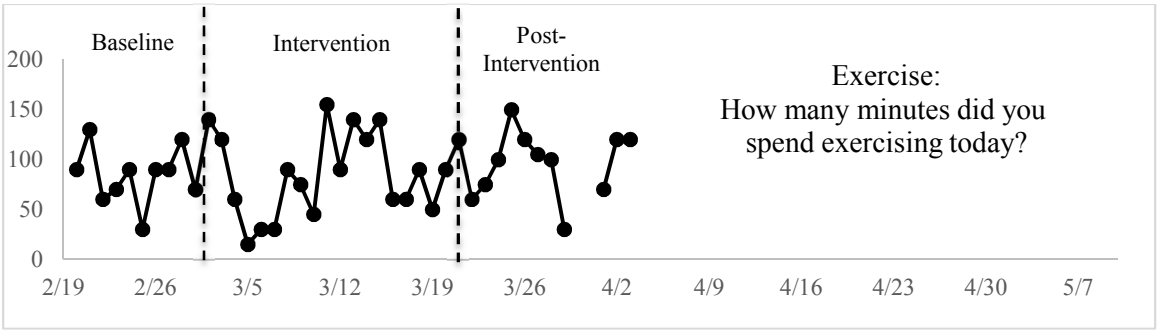
was out of town. We modified Matt's committed action target to practice for at least 5 minutes per day, 4-5 times per week, so that his goal would be more attainable. However, during the follow-up period, Matt only met this reduced goal on 3 of 14 days.



Data analysis: daily diary monitoring of self-care behaviors.

During baseline, Matt met the National Sleep Foundation recommendations of getting at least 7 hours of sleep opportunity per night on 8 out of 10 days. His sleep opportunity remained high throughout the beginning of the intervention period but dropped down to below 7 hours per night during the first four days of his spring break trip. Matt's response to the daily diary question assessing mindfulness, which started out low during baseline and increased steadily, also declined at the onset of his spring break trip, then increased again during the last 4 days of the intervention period. Matt's reported number of meaningful social interactions ranged between 2-7 during baseline, intervention, and follow-up except for a sharp increase on a single day during his spring break trip.




Baseline
Intervention
Post-Intervention
200
150
100
50
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2/26
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4/23
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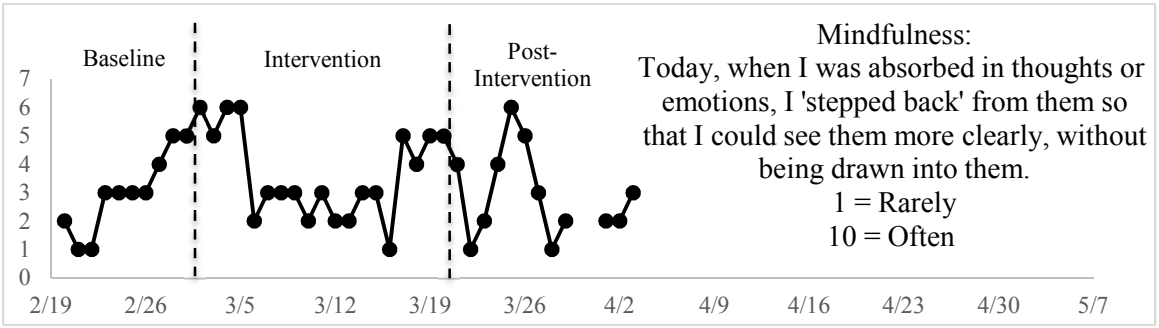
Exercise:
How many minutes did you spend exercising today?


Baseline
Intervention
Post-Intervention
7
6
5
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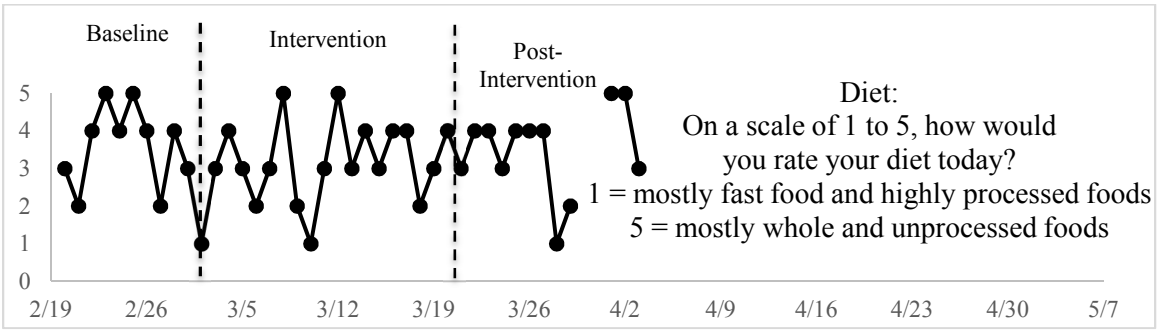
Mindfulness:
Today, when I was absorbed in thoughts or emotions, I 'stepped back' from them so that I could see them more clearly, without being drawn into them.
1 = Rarely
10 = Often


Baseline
Intervention
Post-Intervention
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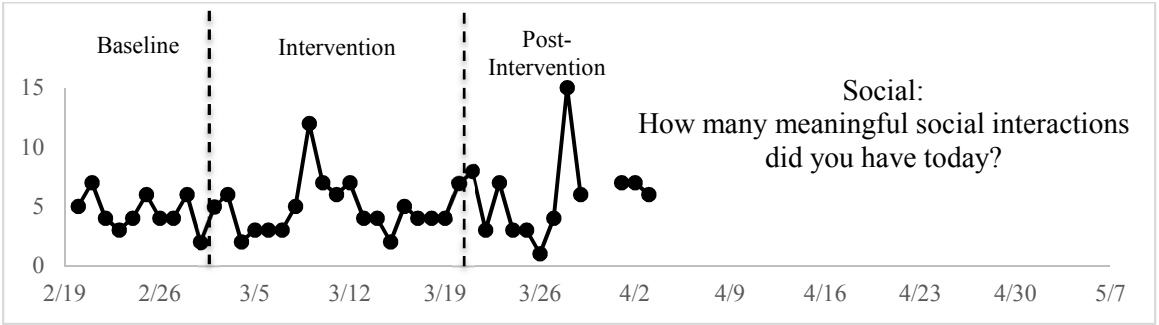
3/5
3/12
3/19
3/26
4/2
4/9
4/16
4/23
4/30
5/7
Diet:
On a scale of 1 to 5, how would you rate your diet today?
1 = mostly fast food and highly processed foods
5 = mostly whole and unprocessed foods


Baseline
Intervention
Post-Intervention
15
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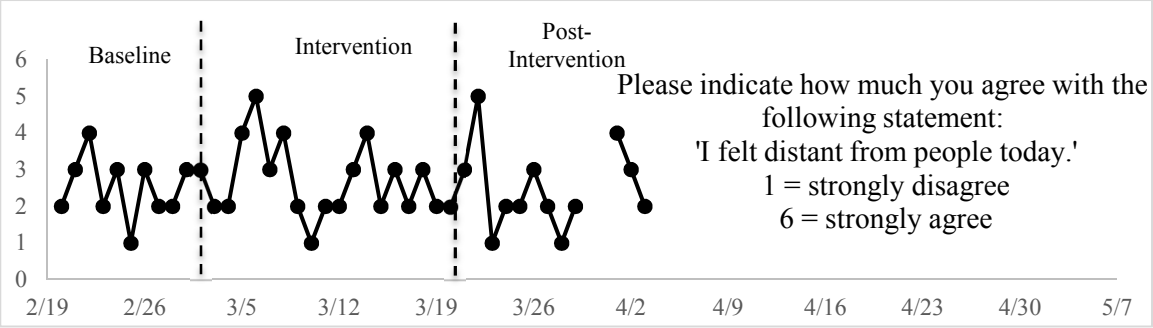
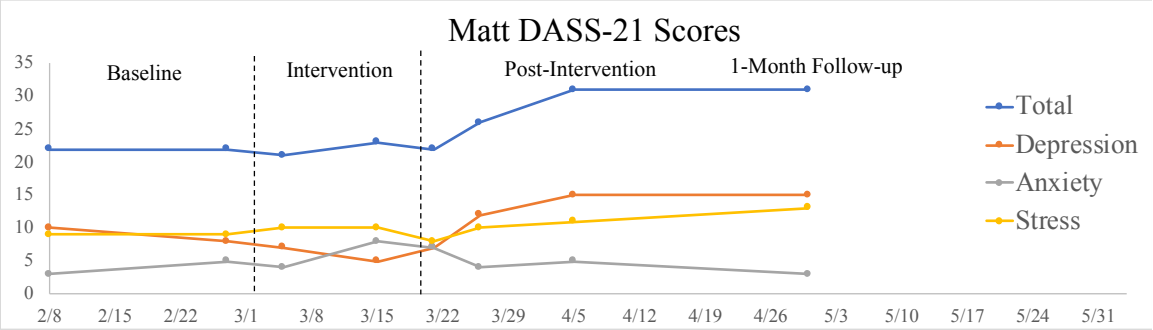
Social:
How many meaningful social interactions did you have today?



Data analysis: DASS-21 scores.

At screening, Matt endorsed symptoms of severe depression, mild anxiety, and moderate stress. Matt experienced a modest reduction in depressive symptoms during the intervention, however that reduction appears to be part of a trend beginning in baseline. Post-intervention, Matt's depression increased and remained elevated above baseline levels at 1-month follow-up. Matt's reported level of anxiety elevated slightly during the intervention and that trend of modest elevation in anxiety continued into the post-intervention period and at follow-up. Stress remained the same throughout baseline and intervention, but increased in post-intervention and at follow-up. Generally, Matt's levels of distress worsened post-intervention and remained high at follow-up.



Participant 2: Nora.

General description of course of intervention.

Nora reported that her values included relationships with family and friends, her career, political engagement, and health/self-care. In the initial meeting she reported that it was very important to her to be in a committed relationship and to start a family of her own someday. She stated that she already engaged in some regular behaviors related to her values, including weekly lunch dates with friends, attending political events on campus, dating, and calling her family regularly.

During our first meeting, Nora reported that she struggled with feelings of inadequacy, guilt, and self-judgment related to fears of not being "good enough." This general fear permeated several different areas of her life, including body image, relationships, and her work in graduate school. She regularly experienced concerns about her performance as a graduate student (e.g. "I'm behind on my work", "what if I don't finish the program?") and her ability to have a relationship (e.g. "I'm going to be alone forever", "I'm never going to find a partner"). She stated that she sometimes felt sad and despondent, as if she was in a "black cloud." Nora engaged in active patterns of avoidance including binge eating, excessive alcohol consumption, and pursuing unhealthy relationships, as well as passive avoidance patterns such as napping and ignoring communication attempts from her friends.

Selecting idiographic self-care target and linking to values.

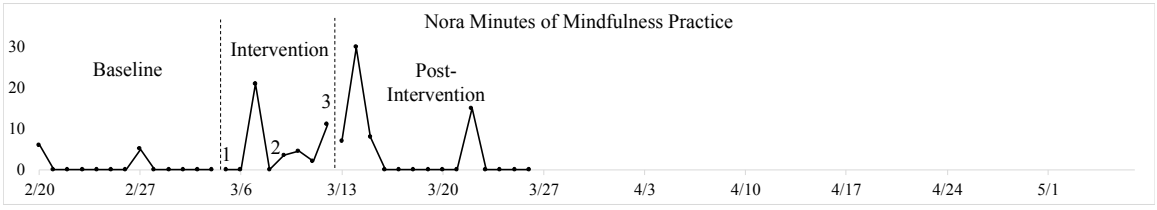
Nora reported that she had dabbled in mindfulness practice in the past but had never practiced regularly. She said she was interested in mindfulness practice because she felt it would improve her interpersonal skills, which would strengthen her relationships with her friends and family. Nora also believed that engaging in mindfulness practice would increase her wellbeing, which would relate to her values of health and self-care. She further stated that mindfulness practice would be helpful for her engagement with political issues that were important to her.

Taking all of this into account, Nora chose mindfulness practice to be her idiographic dependent variable. She set her committed action target to practice mindfulness for 5 minutes every evening.

Data analysis: idiographic dependent variable.

Nora was in baseline for 13 days, during which she practiced mindfulness twice for about 5 minutes each time. Between meetings 1 and 2 of the intervention, Nora met her practice goal 1 out of 3 days, when she practiced mindfulness on one occasion for 21 minutes. During the second meeting, we modified Nora's committed action target to practice for 3-5 minutes each night in order to make her goal more attainable. Between meetings 2 and 3, Nora met her new target on 2 out of 4 days. During the third meeting of the intervention, Nora stated that although she enjoyed practicing mindfulness, she frequently felt that she was "too busy" to practice. She noticed that she preferred to practice less often but for longer periods of time. Still, Nora indicated that she wanted her practice to become more regular, so her goal for the post-intervention period remained the same: to practice between 3-5 minutes each night.

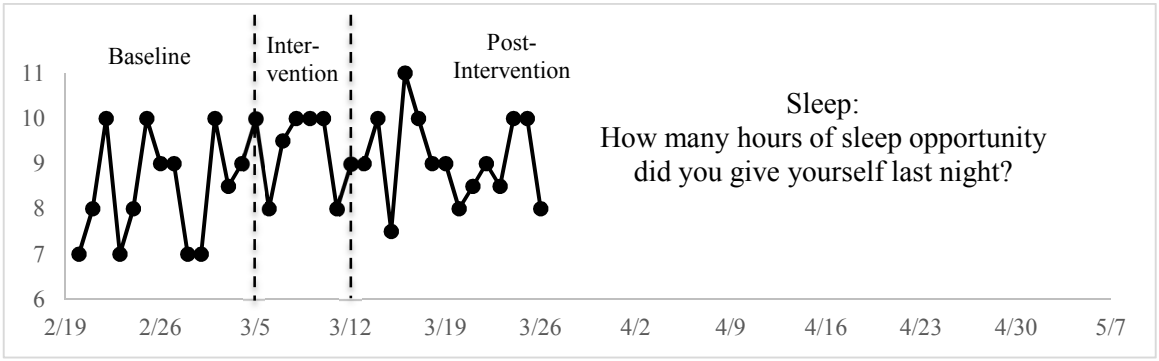
In the first week of the post-intervention period, Nora met her practice goal on 4 out of 7 days, with practice times ranging from 7-30 minutes each time. In the second week, she met her goal on 1 out of 7 days, practicing for 15 minutes.

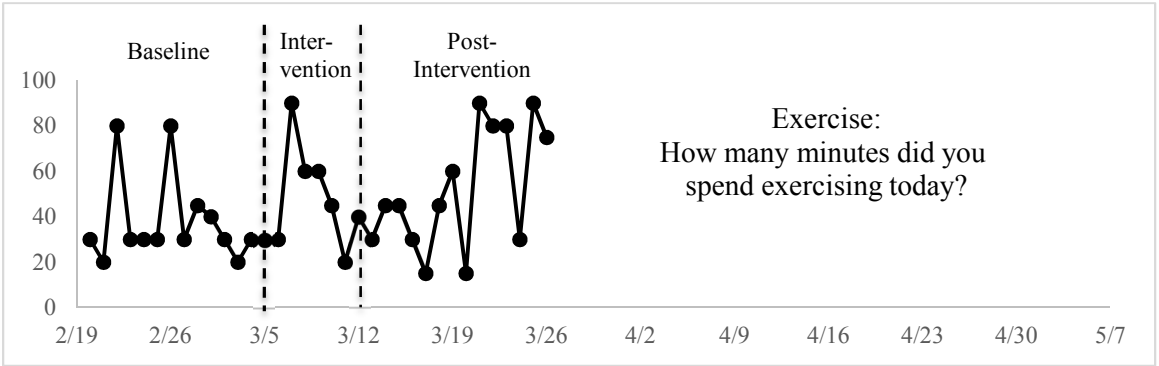


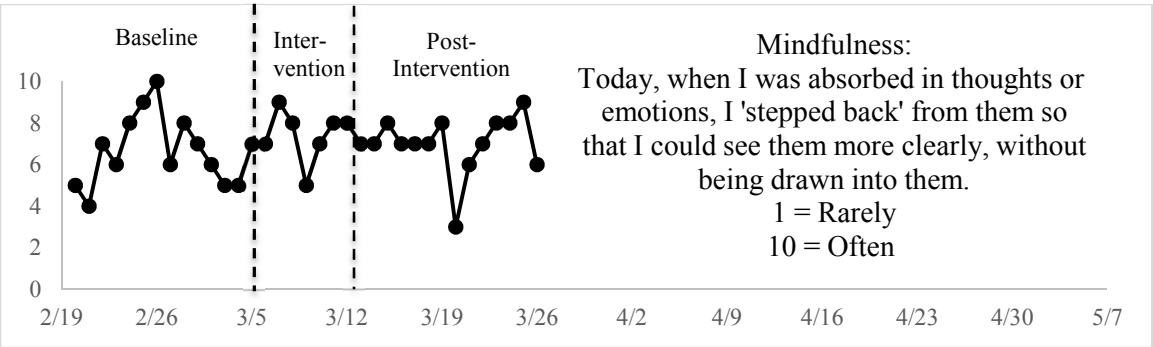
Data analysis: daily diary monitoring of self-care behaviors.

Nora's reported sleep opportunity met the National Sleep Foundation recommendations on all 13 nights during baseline, where her sleep opportunity varied between 7 and 10 hours each

night. During the intervention and post-intervention periods, her sleep opportunity increased. During these periods, with the exception of one night, she gave herself no less than 8 hours of sleep opportunity each night. With regard to exercise, Nora spent at least 20 minutes and as much as 80 minutes per day exercising during baseline. During the intervention and post-intervention periods, that range widened to between 15 and 90 minutes each day, resulting in an overall upward trend. Nora's diet showed a similar pattern, decreasing in quality during baseline but increasing overall during the intervention and post-intervention periods, showing an overall upward trend. The two questions assessing Nora's social life were consistent with each other in that overall, her number of meaningful social interactions declined steadily, while she reported feeling more distant from people as time went on.






Baseline
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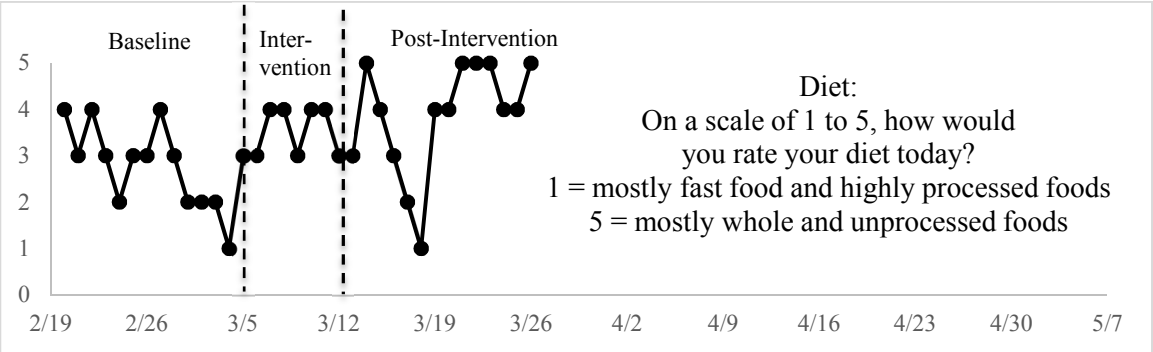
4/23
4/30
5/7
Mindfulness:
Today, when I was absorbed in thoughts or emotions, I 'stepped back' from them so that I could see them more clearly, without being drawn into them.
1 = Rarely
10 = Often


Baseline
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Post-Intervention
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4/2
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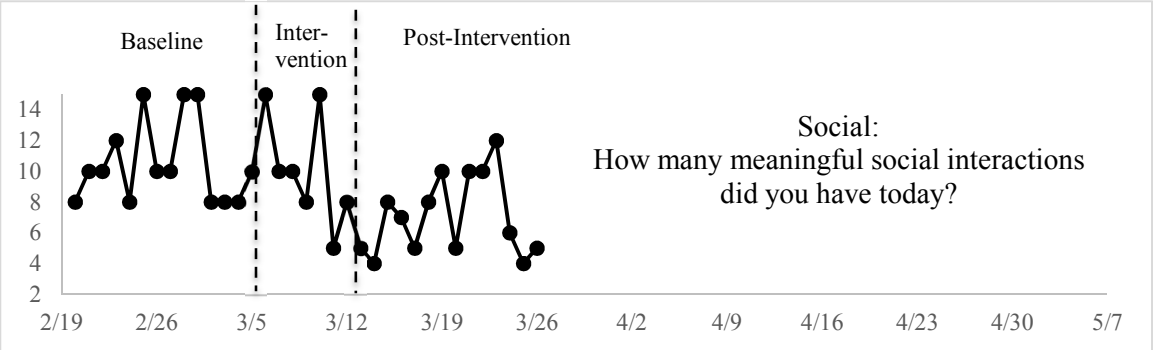
4/30
5/7
Diet:
On a scale of 1 to 5, how would you rate your diet today?
1 = mostly fast food and highly processed foods
5 = mostly whole and unprocessed foods


Baseline
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Post-Intervention
14
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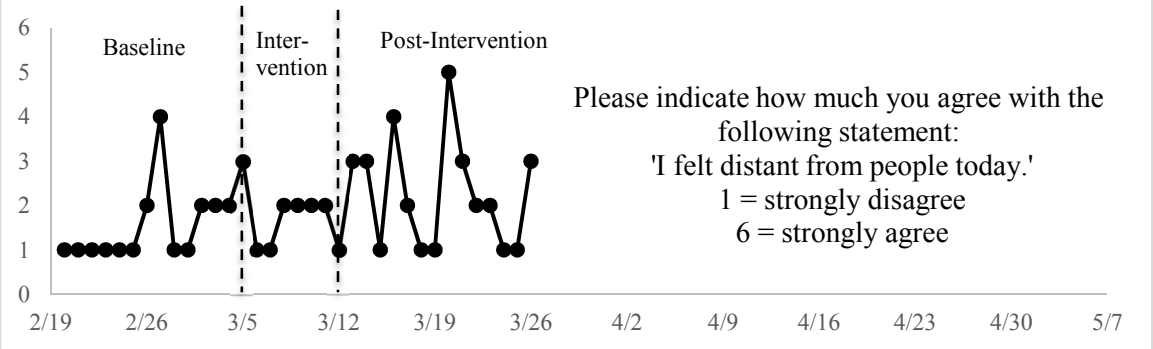
Social:
How many meaningful social interactions did you have today?


Baseline
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Post-Intervention
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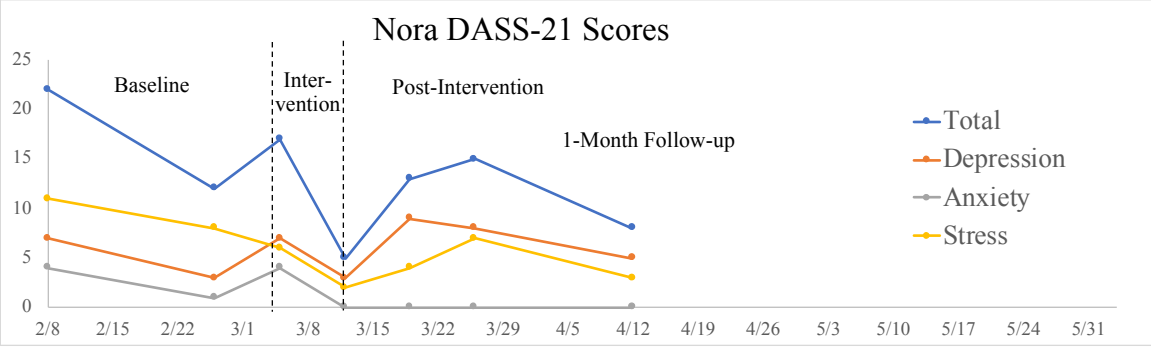
5/7
Please indicate how much you agree with the following statement:
'I felt distant from people today.'
1 = strongly disagree
6 = strongly agree

Data analysis: DASS-21 scores.

At screening, Nora endorsed symptoms of moderate depression, mild anxiety, and moderate stress. Nora experienced a modest reduction in stress and anxiety symptoms during the intervention, however that reduction appears to be part of a trend beginning in baseline. Throughout baseline and intervention, Nora's depression scores went back and forth from moderate to normal. Depression, anxiety, and stress were all in the normal range at the end of the intervention. At post-intervention, her depression went back up to the moderate range, and decreased to the mild range at follow-up. Anxiety remained in the normal range at post-intervention and follow-up, and stress ranged from mild to normal in post-intervention and ended in the normal range at follow-up. In general, Nora's levels of distress decreased from baseline to post-intervention and remained in the mild or normal range at follow-up.



Participant 3: Annabelle.

General description of course of intervention.

Annabelle reported that her values included her relationships with her family and friends, faith, health, kindness, and authenticity. In the initial meeting, she reported that she regularly engaged in behaviors in line with her values, such as attending church every week, working out, and cooking with friends.

During the first meeting of the intervention, Annabelle reported that she struggled with feelings of stress, anxiety, and indecisiveness, stating that these feelings intensified during busier times in graduate school when she felt overwhelmed with the amount of work she had to do. During these times, she experienced unpleasant thoughts (e.g. "I don't even know where to start", "am I making the right decision?") as well as physical sensations (e.g. increased heart rate, sweaty hands). Annabelle reported that she also frequently worried about her future (i.e. "what am I going to do after I graduate?"). She engaged in active patterns of avoidance such as over-planning and overextending herself to others, as well as passive patterns of avoidance including not attending plans with friends and secluding herself.

Selecting idiographic self-care target and linking to values.

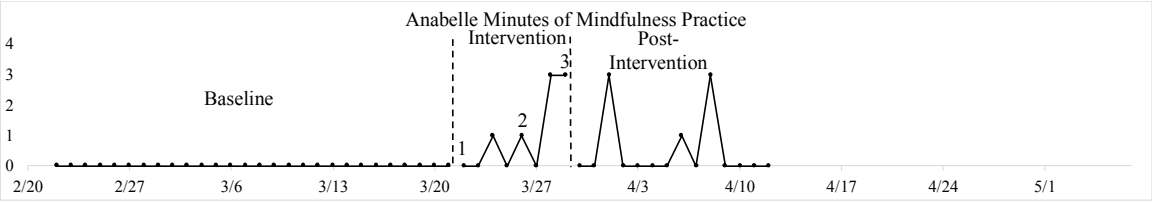
Annabelle reported that she had heard of mindfulness but was not fully aware of what it was. After some psychoeducation on mindfulness and its benefits, she decided to choose it as her idiographic dependent variable. Annabelle believed that mindfulness would be helpful for her stress and anxiety, which could improve her connections with friends and family. She indicated that practicing mindfulness would be helpful for treating herself with kindness, which she hoped would increase her kindness towards others. Since Annabelle had not previously been familiar with mindfulness, we decided to start her committed action target at 1-5 minutes of mindfulness practice twice per week.

Data analysis: idiographic dependent variable.

Annabelle did not practice mindfulness during the 28 days that she was in baseline. Between meetings 1 and 2 of the intervention, Annabelle met her practice goal 1 out of 4 days by practicing once for 1 minute. Between meetings 2 and 3, Annabelle met her committed action goal on 3 out of 4 days, with practice times ranging from 1-3 minutes each time. During the third

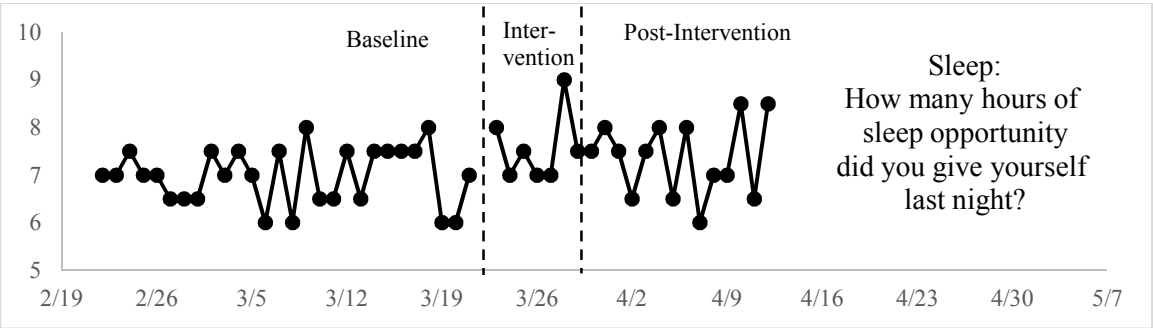
meeting of the intervention, Annabelle indicated that she wanted to increase the number of days per week that she practiced mindfulness, so her goal for the post-intervention period became to practice for 1-5 minutes four times per week.

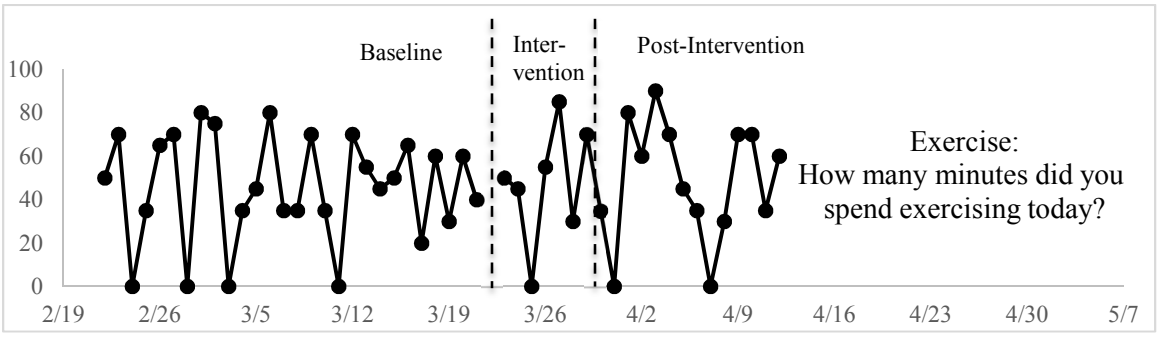
In the first week of the post-intervention period, Annabelle met her practice goal on 1 out of 7 days when she practiced for 3 minutes. In the second week, she met her goal on 2 out of 7 days.



Data analysis: daily diary monitoring of self-care behaviors.

Annabelle's reported sleep opportunity ranged between 6-8 hours per night during baseline. During the intervention period, her sleep opportunity increased, ranging from 7-9 hours per night. In the post-intervention period, her sleep opportunity decreased again, ranging from 6-8.5 hours per night. Annabelle's response to the question assessing mindfulness showed an overall increase throughout the baseline, intervention, and post-intervention periods. With regard to her social life, Annabelle's reported number of meaningful social interactions increased steadily beginning in baseline and continued to increase in the intervention and post-intervention periods, while she reported feeling less distant from people as time went on.




Baseline
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3/12
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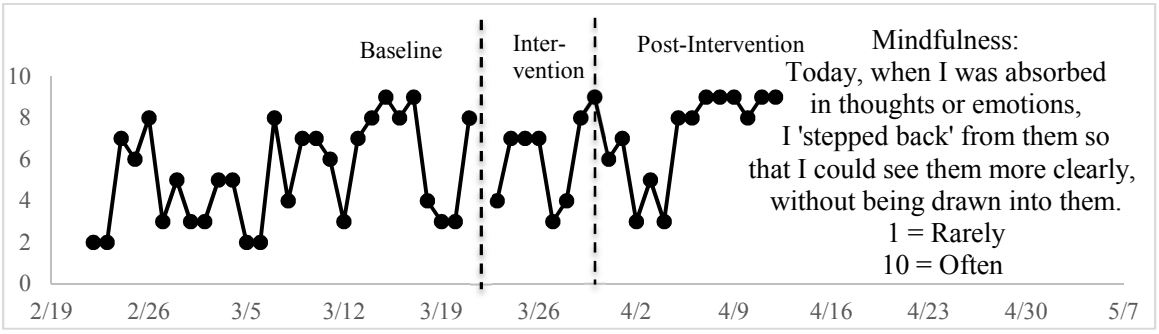
5/7
Exercise:
How many minutes did you
spend exercising today?


Baseline
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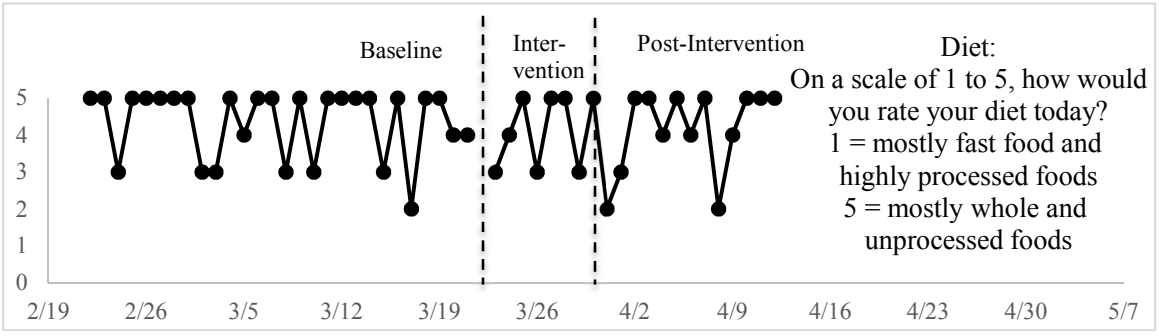
3/26
4/2
4/9
4/16
4/23
4/30
5/7
Mindfulness:
Today, when I was absorbed
in thoughts or emotions,
I 'stepped back' from them so
that I could see them more clearly,
without being drawn into them.
1 = Rarely
10 = Often


Baseline
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Post-Intervention
5
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2/19
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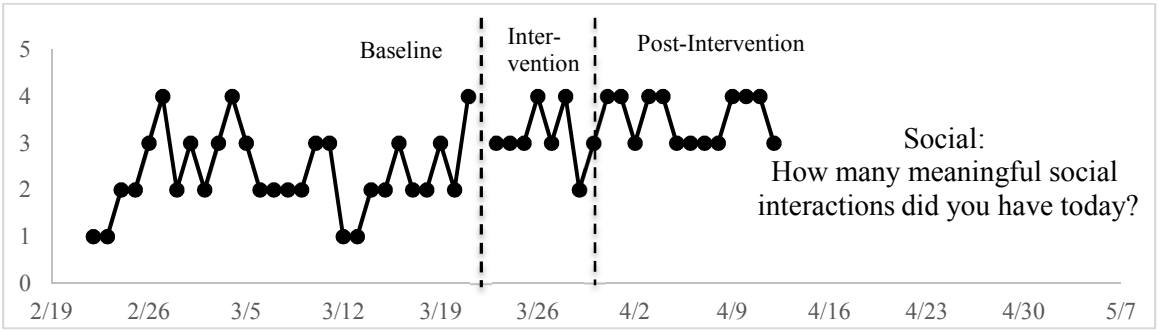
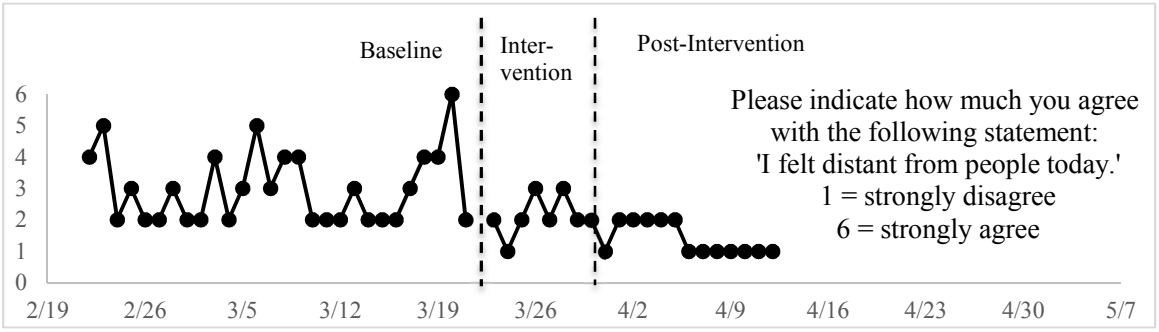
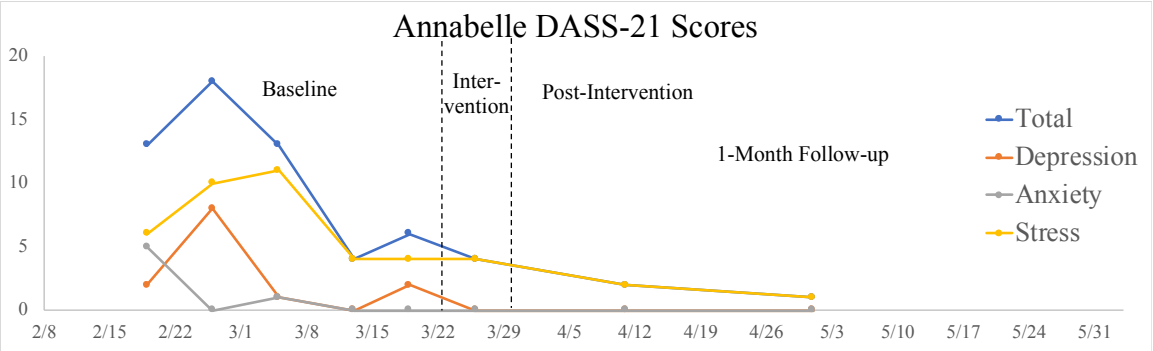
3/5
3/12
3/19
3/26
4/2
4/9
4/16
4/23
4/30
5/7
Diet:
On a scale of 1 to 5, how would
you rate your diet today?
1 = mostly fast food and
highly processed foods
5 = mostly whole and
unprocessed foods





Data analysis: DASS-21 scores.

At screening, Annabelle endorsed symptoms of moderate anxiety and no symptoms of depression or stress. Her reported symptoms of stress increased to the moderate range in the first few weeks of baseline before dropping back into the normal range and remaining there for the duration of the study. Annabelle's anxiety symptoms decreased to the normal range early in baseline and remained in that range throughout intervention, post-intervention, and at follow-up. After a brief jump to the moderate range at one timepoint early in baseline, her depression symptoms returned to the normal range and stayed there for the duration of the study. In general, Annabelle's levels of distress decreased from baseline to post-intervention and remained in the normal range at follow-up.



Participant 4: Ally.

General description of course of intervention.

Ally reported that her values included connecting with people (e.g. friends and family), spirituality, authenticity, teaching, and wellbeing. She stated that she already spent time engaging in behaviors related to her values, such as exercising, dancing, making gifts for people, and searching for a local church or spiritual community.

During our first meeting, Ally reported that she struggled with feelings of anxiety, depression, and low self-worth. She stated that she often had a general sense that something was "wrong" with her. Ally experienced troublesome thoughts (e.g. "I'm not good enough", "I'm too lazy") as well as physical sensations (i.e. trouble breathing, numbness/tingling, heart pounding). She reported that she often felt low in energy or "lethargic," and that she experienced many body image concerns (e.g. "I hate my body", "I've been cursed with this body"). Ally engaged in active patterns of avoidance including overworking herself at the gym and spending money unnecessarily, as well as passive patterns of avoidance such as isolating herself at home, skipping social events, skipping class/meetings, not speaking to others, and not going to the gym.

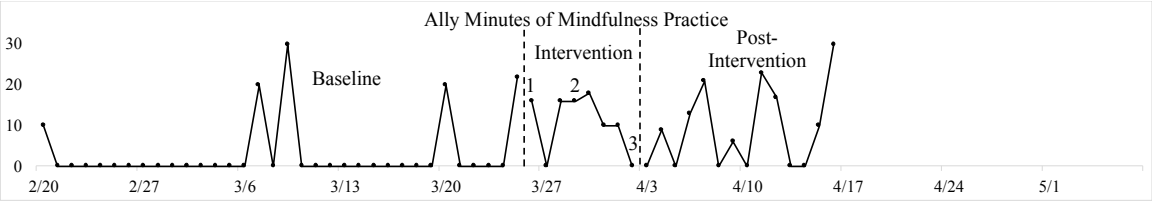
Selecting idiographic self-care target and linking to values.

Ally reported that she practiced mindfulness occasionally and wanted to develop a more regular practice pattern. She felt that regular mindfulness practice would be helpful for her

values of connecting with people, wellbeing, and spirituality. Ally also believed that mindfulness practice would help her move through the unpleasant emotions she experienced during the difficult process of trying to find a local spiritual community. Ally chose mindfulness practice as her idiographic dependent variable and set her committed action target to practice for 10 minutes, three times per week.

Data analysis: idiographic dependent variable.

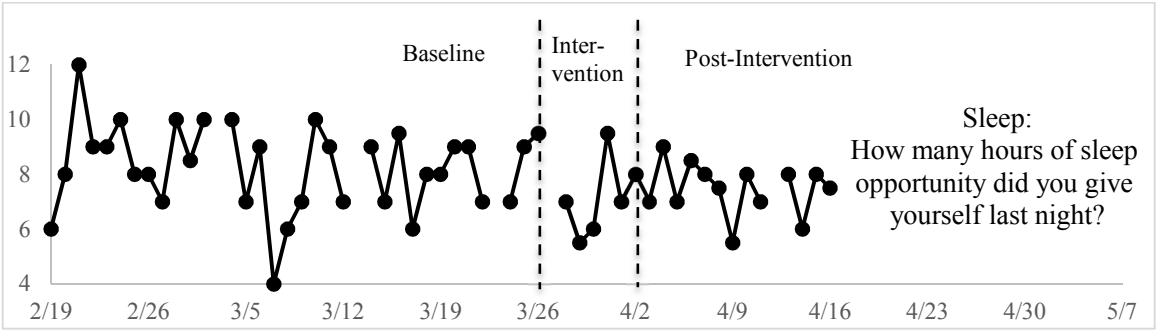
Ally was in baseline for 34 days, during which she practiced mindfulness five times for 10-22 minutes each time. Between meetings 1 and 2 of the intervention, Ally met her practice goal 2 out of 3 days, when she practiced mindfulness twice for 16 minutes each time. Between meetings 2 and 3, Ally met her target on 3 out of 4 days, with practice times ranging from 10-18 minutes. Because Ally continued to hit her practice goal consistently throughout the intervention, we kept her target the same for the post-intervention period. In the first week of the post-intervention period, Ally met her practice goal on 2 out of 7 days. In the second week, she met her goal on 4 out of 7 days.

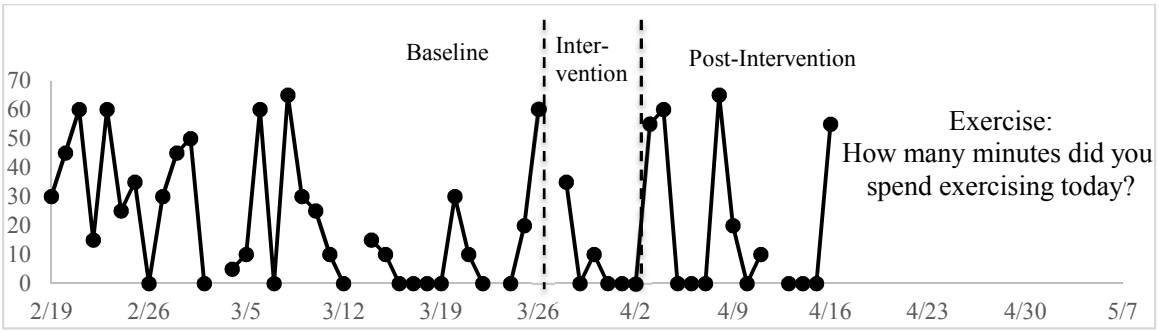


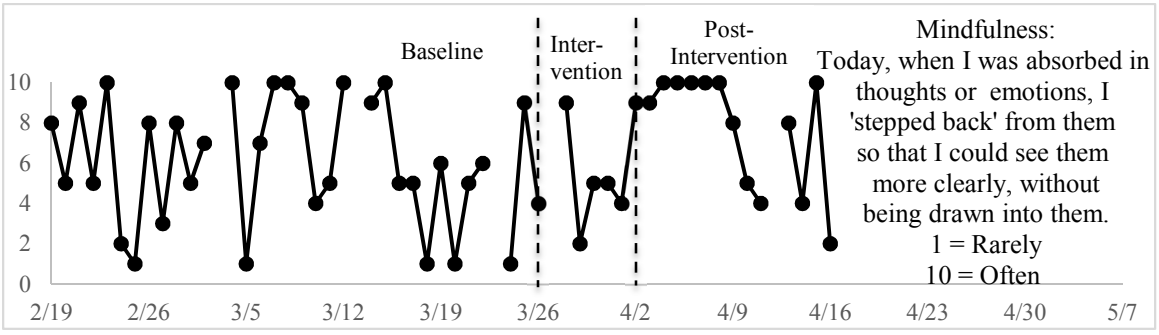
Data analysis: daily diary monitoring of self-care behaviors.

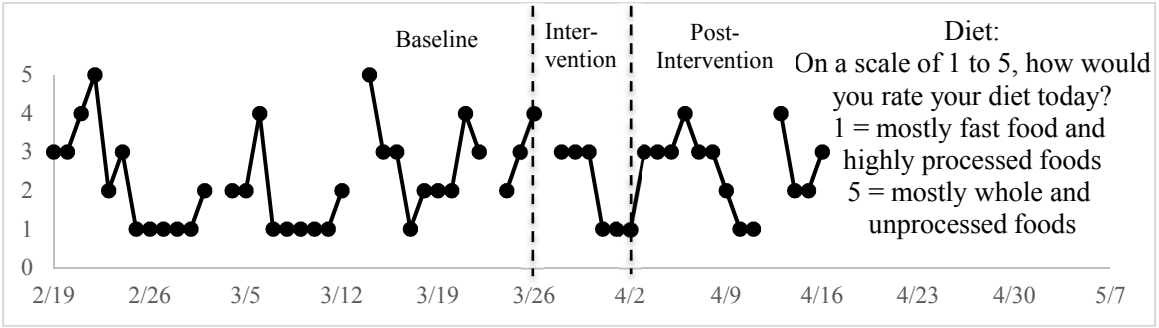
Ally's reported sleep opportunity varied between 4-12 hours per night during baseline. As she approached the end of the baseline period, that range decreased, and continued to decrease throughout the intervention. By the post-intervention period, Ally ranged from 5.5-9 hours of sleep opportunity per night, showing a more consistent sleep schedule that fluctuated less. With regard to exercise, Ally's time spent exercising decreased slightly throughout the

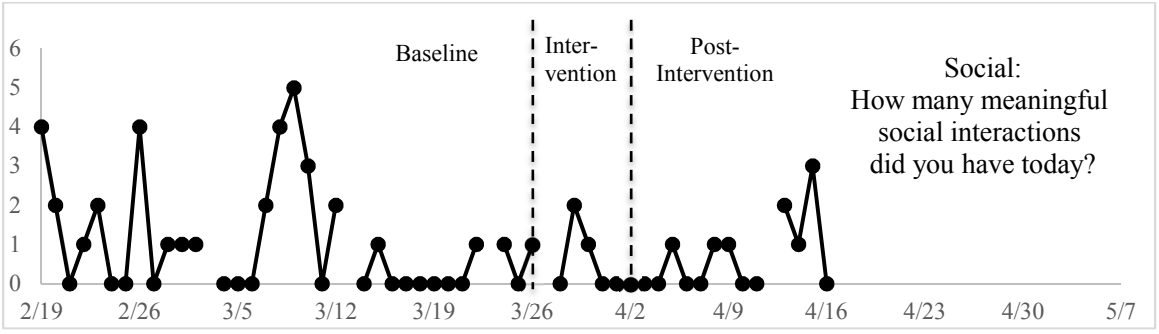
study period, a trend that began in baseline. Ally's number of meaningful social interactions showed a similar pattern, decreasing as the study period went on.

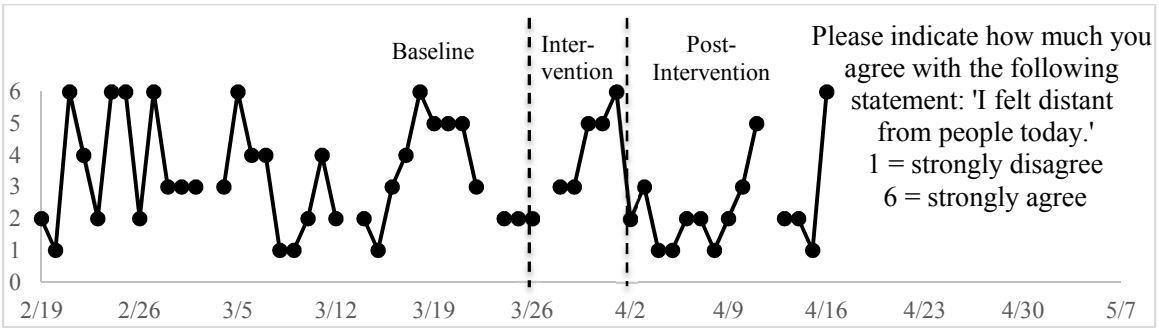






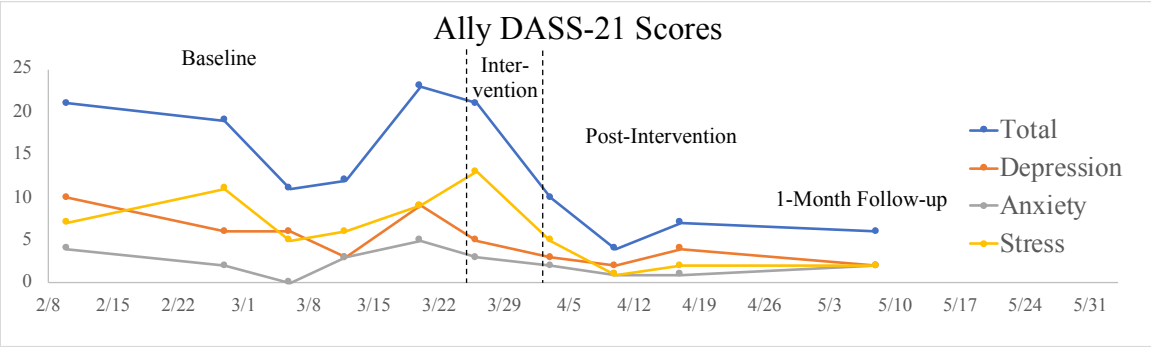






Data analysis: DASS-21 scores.

At screening, Ally endorsed symptoms of severe depression, mild anxiety, and mild stress. Throughout the rest of the baseline period, Ally's depressive symptoms fluctuated between moderate and normal, and decreased overall in the intervention and post-intervention periods. Her anxiety symptoms vacillated between normal and moderate during baseline, and between normal and mild during the intervention and post-intervention periods. Her stress symptoms ranged from normal to severe in the baseline and intervention periods, dropping to normal in the post-intervention period. Depression, anxiety, and stress symptoms were all within the normal ranges at follow-up.



Participant 5: Rob.

General description of course of intervention.

Rob's values included his family, health, career, and religion. He stated that he already engaged in some behaviors related to his values, such as exercising regularly and eating whole, unprocessed foods on a regular basis.

During our first meeting, Rob reported that he regularly struggled with feelings of stress, irritability, and fatigue. He stated that these unpleasant feeling were related to his graduate school work – specifically, he believed his thoughts about how there is "not enough time" to get all his work done, and that if he doesn't work for long hours into the night he is "not good enough." Rob also experienced physical sensations that were undesirable, including racing heartbeat and a feeling of restlessness. He reported that he often had trouble concentrating on his schoolwork, which was very distressing to him. Rob engaged in active patterns of avoidance including overworking and exercising too much.

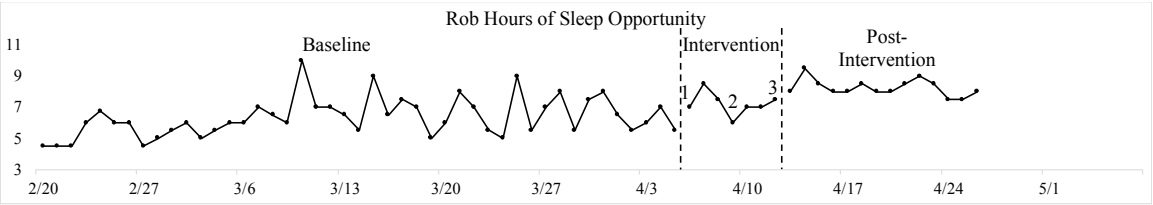
Selecting idiographic self-care target and linking to values.

Rob reported that he did not prioritize his sleep because he felt he had too much work to get done and not enough time to do it. After some psychoeducation about how sleep is related to wellbeing in many ways, Rob chose sleep opportunity as his idiographic dependent variable. He believed that getting more sleep would help with his fatigue and concentration, which would be

helpful for his career. He also believed that getting more sleep would be helpful for his feelings of irritability, which would improve his relationships with family members.

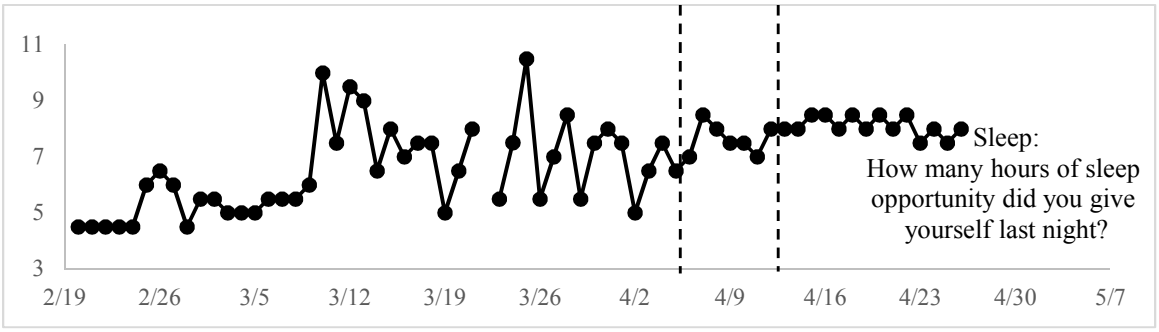
Data analysis: idiographic dependent variable.

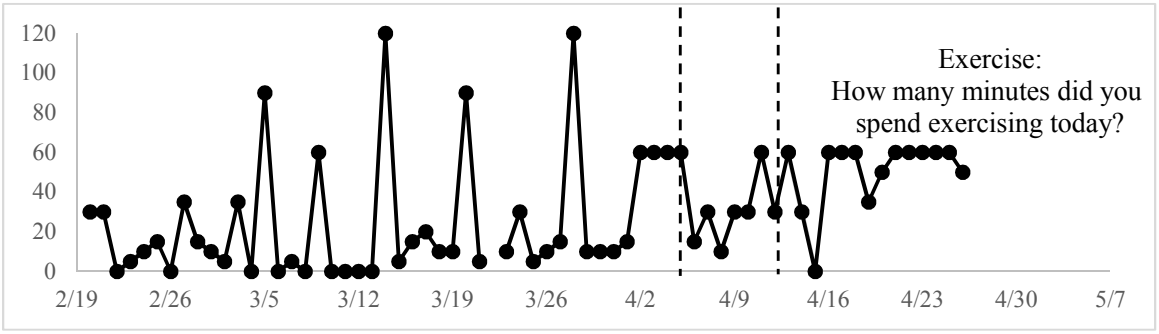
Rob was in baseline for 44 days, and during that time, his sleep opportunity ranged from 4.5-10 hours per night. At meeting 1 of the intervention, he set his goal to get at least 7 hours of sleep opportunity each night. Between meetings 1 and 2 of the intervention, Rob met his goal 3 out of 4 nights. Between meetings 2 and 3 of the intervention, he met his goal 2 out of 3 nights. At meeting 3, Rob modified his goal to get at least 8 hours of sleep opportunity each night. In the first week of the post-intervention period, Rob met his goal 7 out of 7 nights. In the second week, he met his goal 5 out of 7 nights, ranging from 7.5-9 hours of sleep opportunity each night.

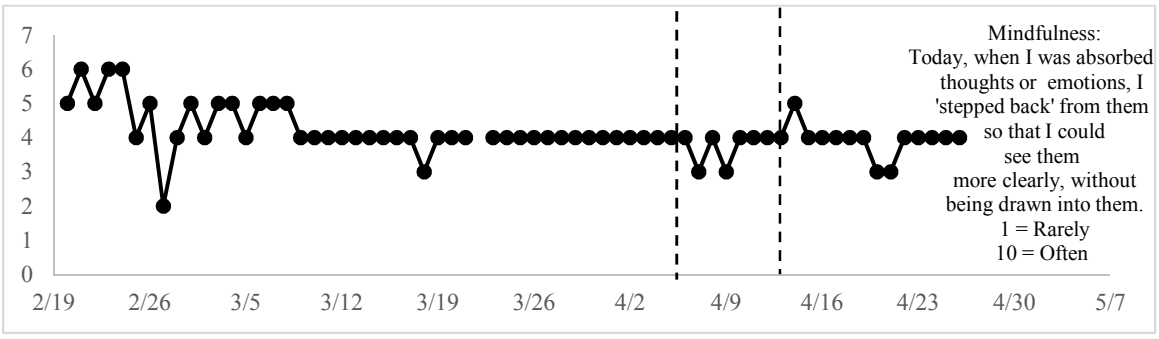


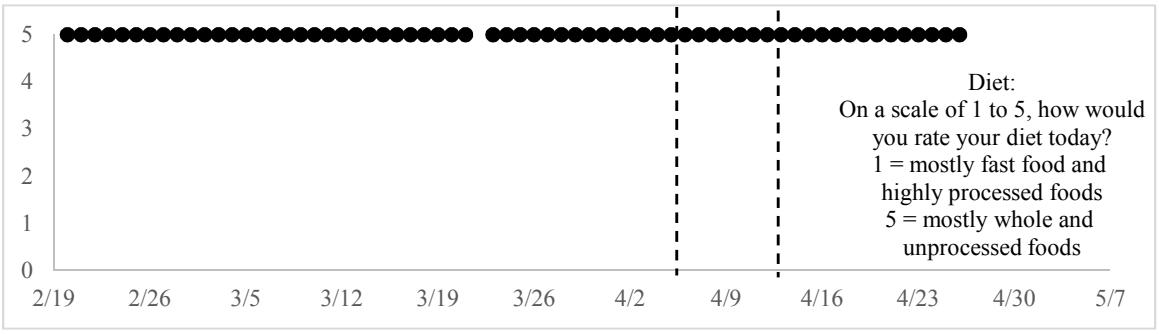
Data analysis: daily diary monitoring of self-care behaviors.

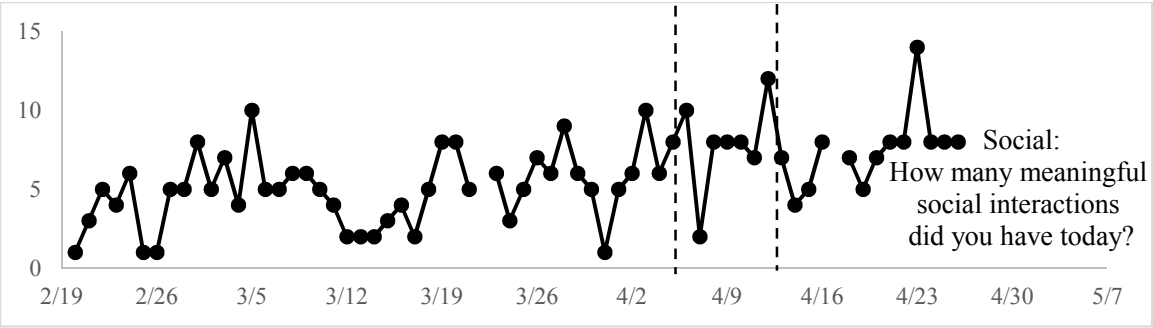
Rob's reported sleep opportunity showed a slow, steady increase that began in baseline and continued throughout the intervention and post-intervention. His range of sleep opportunity also decreased in the intervention and post-intervention periods, showing a more consistent sleep schedule than during baseline. A similar pattern emerged with the number of minutes Rob spent exercising. During baseline, his time spent exercising fluctuated between 0-120 minutes. During intervention and post-intervention, that range shortened to between 0-60 minutes and continued increasing as it became more consistent. Rob's reported number of meaningful social interactions showed a steady increase throughout the study.

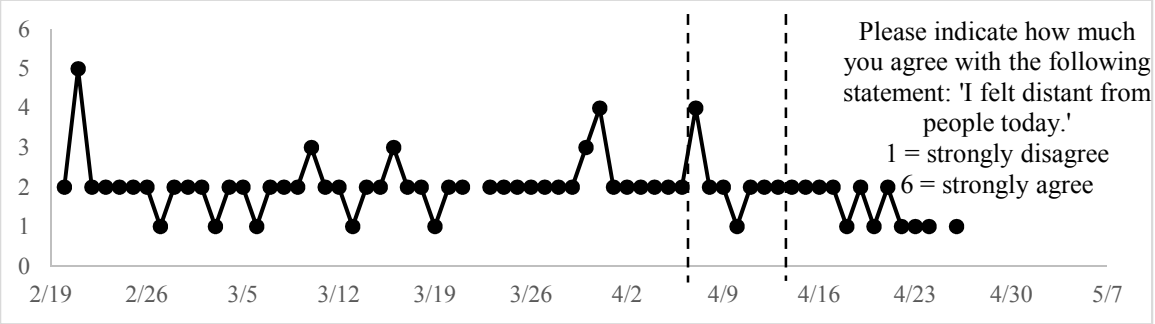

11
9
7
5
3
2/19
2/26
3/5
3/12
3/19
3/26
4/2
4/9
4/16
4/23
4/30
5/7
Sleep:
How many hours of sleep opportunity did you give yourself last night?


120
100
80
60
40
20
0
2/19
2/26
3/5
3/12
3/19
3/26
4/2
4/9
4/16
4/23
4/30
5/7
Exercise:
How many minutes did you spend exercising today?


7
6
5
4
3
2
1
0
2/19
2/26
3/5
3/12
3/19
3/26
4/2
4/9
4/16
4/23
4/30
5/7
Mindfulness:
Today, when I was absorbed thoughts or emotions, I 'stepped back' from them so that I could see them more clearly, without being drawn into them.
1 = Rarely
10 = Often

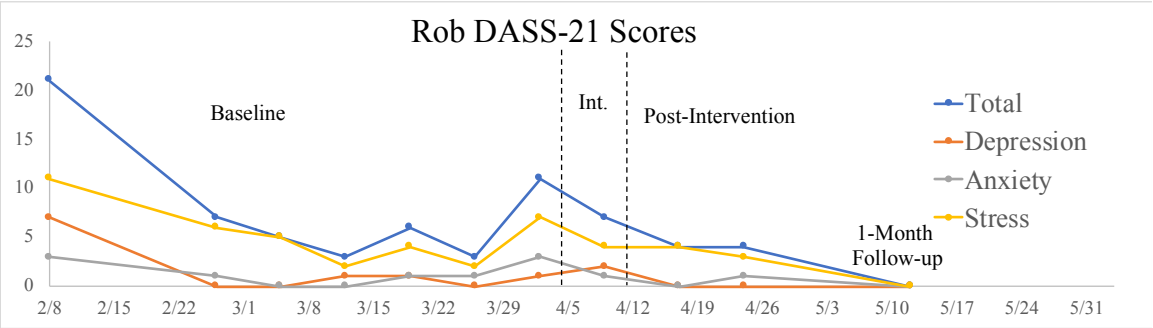

5
4
3
2
1
0
2/19
2/26
3/5
3/12
3/19
3/26
4/2
4/9
4/16
4/23
4/30
5/7
Diet:
On a scale of 1 to 5, how would you rate your diet today?
1 = mostly fast food and highly processed foods
5 = mostly whole and unprocessed foods





Data analysis: DASS-21 scores.

At screening, Rob endorsed symptoms of moderate depression, moderate stress, and mild anxiety. Throughout the rest of the baseline period, his symptoms decreased to the normal range and remained in that range throughout intervention and post-intervention. Depression, anxiety, and stress symptoms were all within the normal ranges at follow-up.



Participant 6: Jen.

General description of course of intervention.

Jen reported that her values included her family, friendships, school/career, and health. She indicated that she regularly engaged in several behaviors related to her values, including weekly lunches with friends, going on walks, and calling family members on the phone.

During our first meeting, Jen reported that she struggled with feelings of depression, self-criticism, and low self-confidence. She stated that she sets very high standards for herself, particularly with regard to her performance in school, and often feels like she doesn't measure up to those standards. Jen reportedly struggled with thoughts about not working hard enough (i.e. "I should have gotten more done yesterday", "What if I didn't do a good job on that paper?"). She also experienced trouble making decisions about her social life (e.g. "I don't know whether to go to the party", "maybe I should have been more social this weekend"). Jen engaged in active patterns of avoidance, such as spending too much time working on schoolwork, and passive patterns of avoidance including isolating herself by avoiding social hangouts.

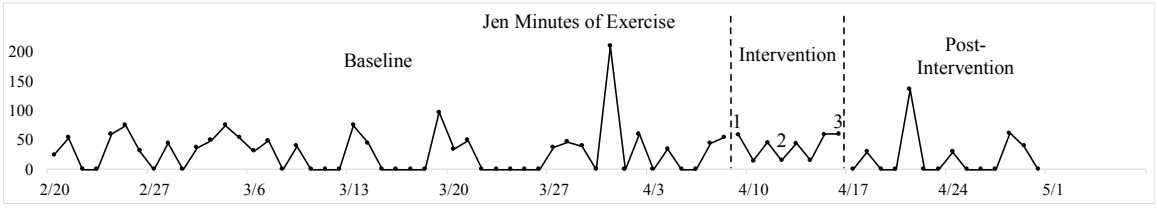
Selecting idiographic self-care target and linking to values.

Jen reported that she exercised sporadically but wanted to develop and stick to a more regular exercise routine, and therefore she chose exercise as her idiographic dependent variable. Jen believed that a consistent exercise routine would be good for her health, and would also be helpful for her friendships, since she planned to schedule walks with friends. She set her committed action target to exercise for at least 15 minutes per day.

Data analysis: idiographic dependent variable.

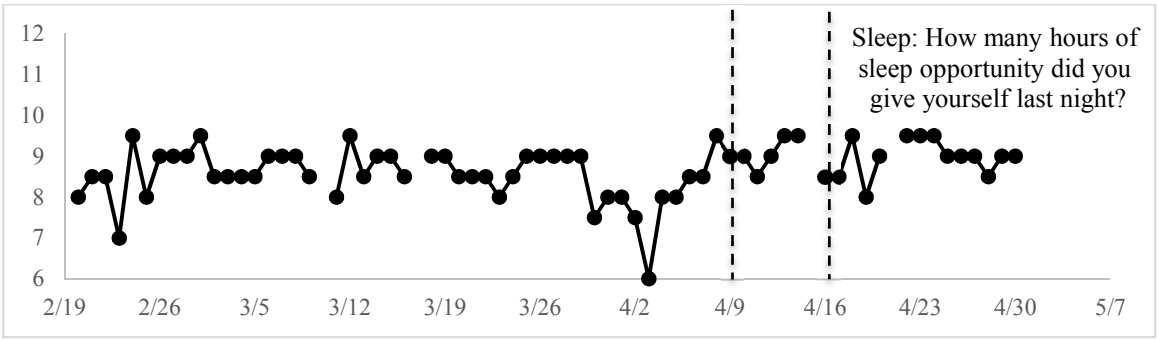
Jen was in baseline for 48 days, where her number of minutes spent exercising ranged between 0 and 210 minutes per day. Between meetings 1 and 2 of the intervention, Jen met her

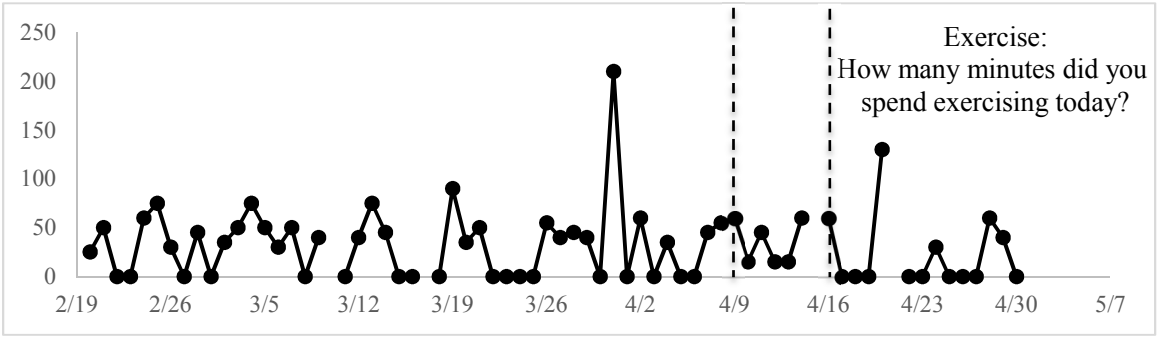
practice goal on 3 out of 3 days. Between meetings 2 and 3 of the intervention, she met her goal on 4 out of 4 days. Because Jen continued to hit her practice goal consistently throughout the intervention, we kept her target the same for the post-intervention period. In the first week of the post-intervention period, Jen met her practice goal on 2 out of 7 days. In the second week, she met her goal on 3 out of 7 days.

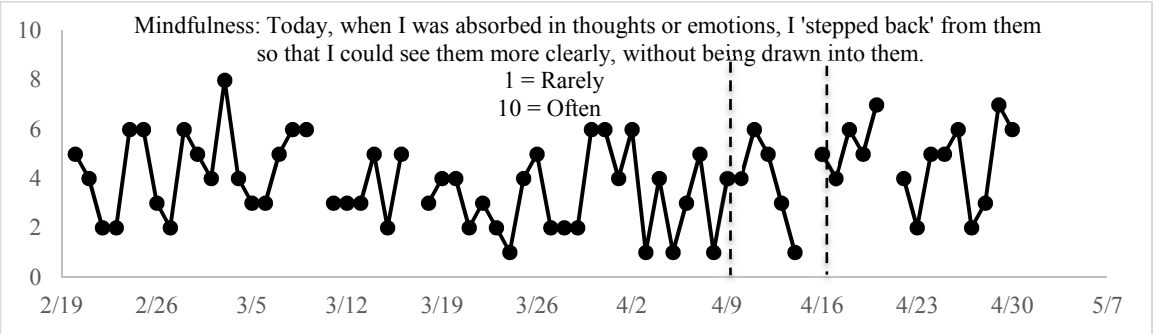


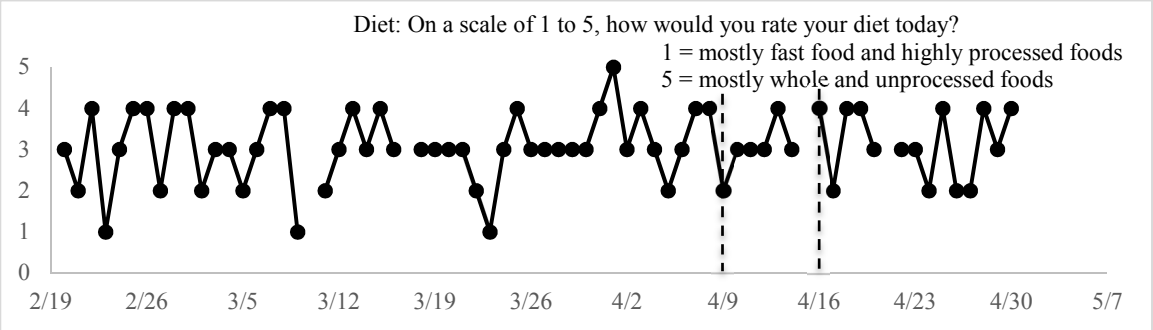
Data analysis: daily diary monitoring of self-care behaviors.

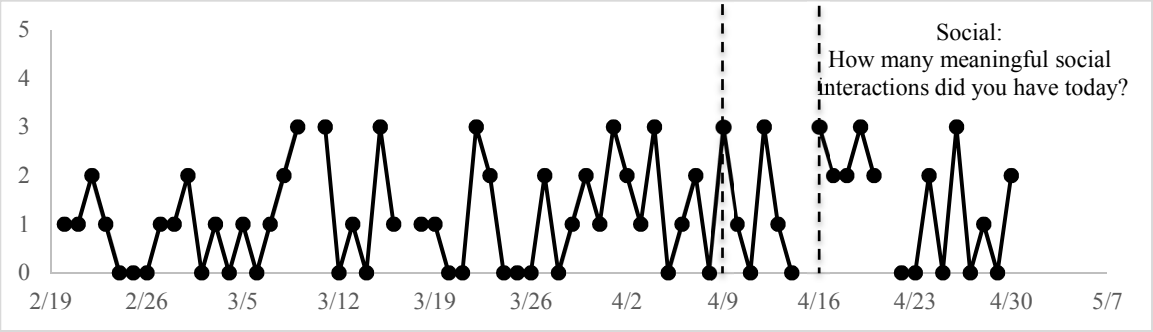
Jen's reported sleep opportunity varied between 6-9.5 hours each night during baseline. During the intervention, that range decreased to between 8.5-9.5 hours each night, showing a more consistent sleep schedule. During the post-intervention period, Jen's range of sleep opportunity stayed consistent at 8-9.5 hours of sleep opportunity per night.

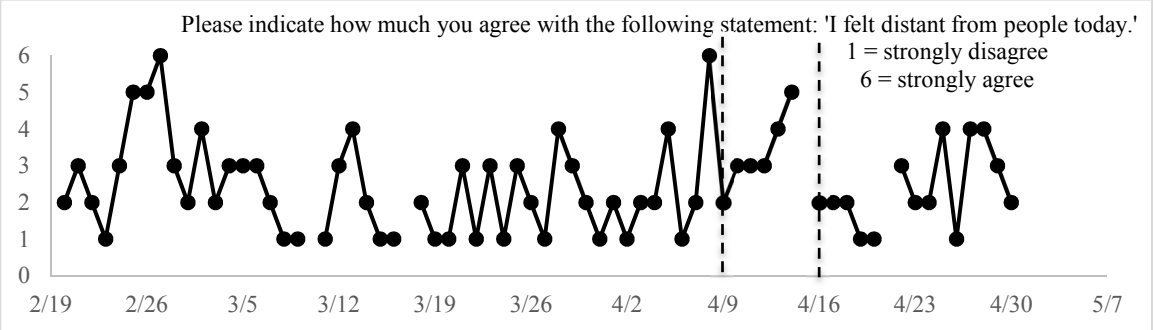








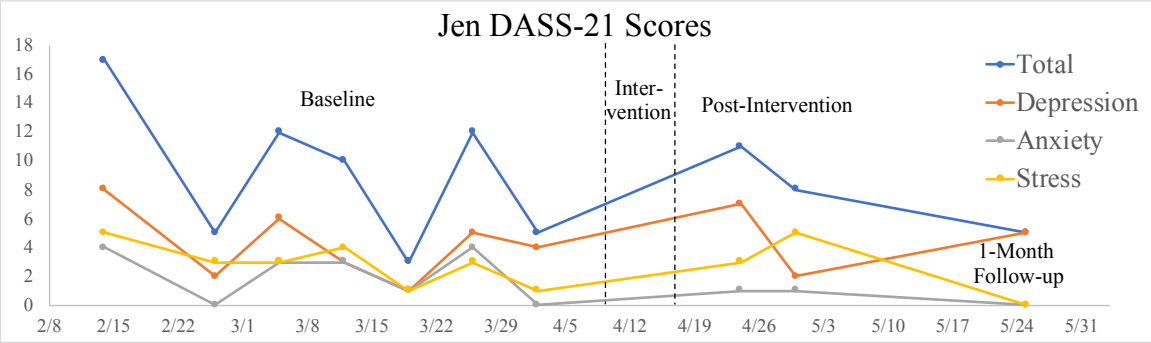




Data analysis: DASS-21 scores.

At screening, Jen endorsed symptoms of moderate depression and mild anxiety.

Throughout the rest of the study period, Jen's depressive symptoms fluctuated between moderate and normal, and ended in mild at follow-up. Her anxiety symptoms decreased to the normal range during the baseline, intervention, and post-intervention periods (with the exception of one uptick to mild during post-intervention), ending at normal at follow-up.



Participant 7: Leena.

General description of course of intervention.

Leena's values included family, health, career, nature, helping others, and religion. She stated that she occasionally engaged in behaviors related to her values, such as gardening, calling her family, reading, teaching, and visiting friends.

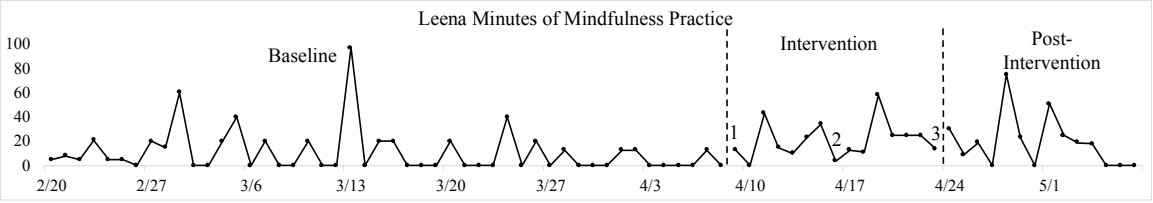
During our first meeting, Leena indicated that she regularly experienced feelings of stress, anxiety, and sadness. She reported often feeling overwhelmed with work and family issues and a general sense that she was "not doing a good enough job." Leena stated that she struggled with disturbing thoughts (i.e. "I'm trapped", "What if I have no future?", "there is no solution") and had trouble making decisions and focusing on work. As an international student, Leena also felt homesick and missed her family. She engaged in active patterns of avoidance including overeating and spending hours on social media, as well as passive patterns of avoidance such as isolating herself from others.

Selecting idiographic self-care target and linking to values.

Leena reported that she had an interest in mindfulness but had never practiced. She indicated that practicing mindfulness would be helpful for managing stress more effectively, which would relate to her value of health. Leena also believed that mindfulness practice would be helpful for her interpersonal relationships and her value of helping others. She chose mindfulness practice as her idiographic dependent variable set her target to listen to practice every day for at least 10 minutes.

Data analysis: idiographic dependent variable.

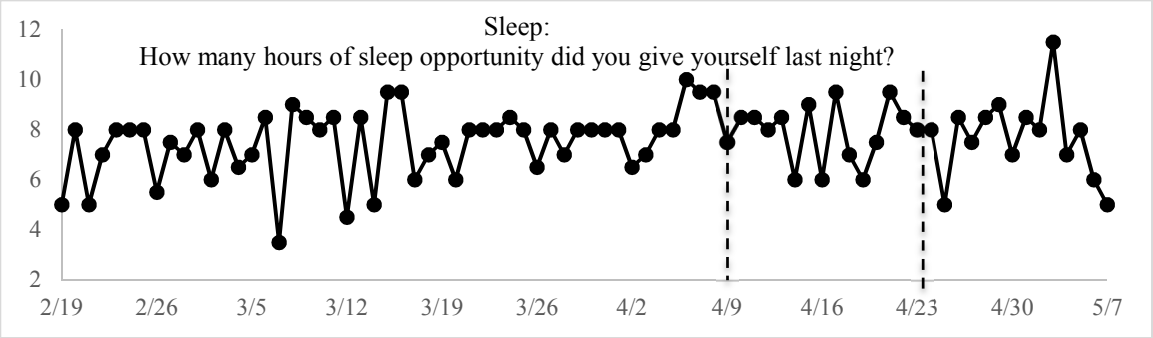
Leena was in baseline for 48 days, during which time her minutes of mindfulness practice varied between 0-97 minutes. More often than not, she did not practice during baseline. Between meetings 1 and 2 of the intervention, Leena met her practice goal 6 out of 7 days, with practice times ranging from 10-43 minutes. Between meetings 2 and 3, Leena met her target on 6 out of 7 days, with practice times ranging from 4-58 minutes. Because Leena was generally hitting her practice goal on most days, we kept her target the same for the post-intervention period. In the first week of the post-intervention period, Leena met her practice goal on 4 out of 7 days. In the second week, she met her goal on 4 out of 7 days.

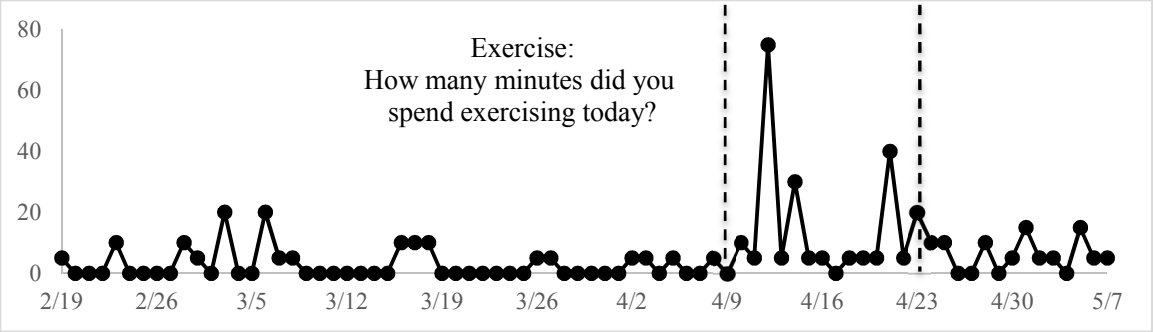


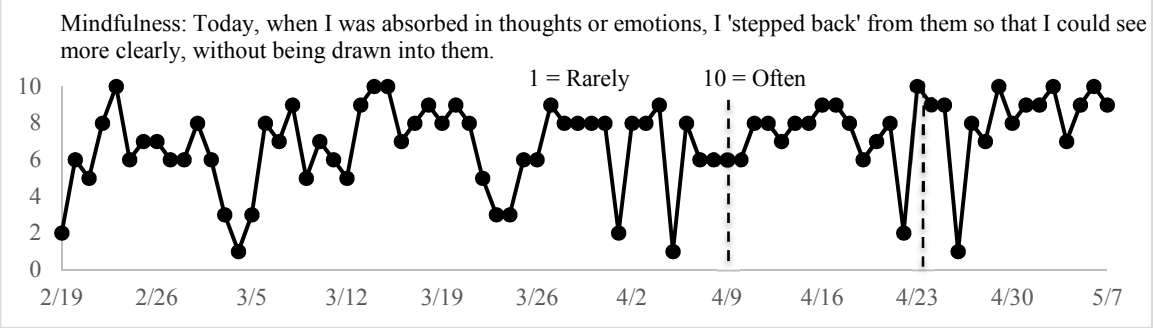
Data analysis: daily diary monitoring of self-care behaviors.

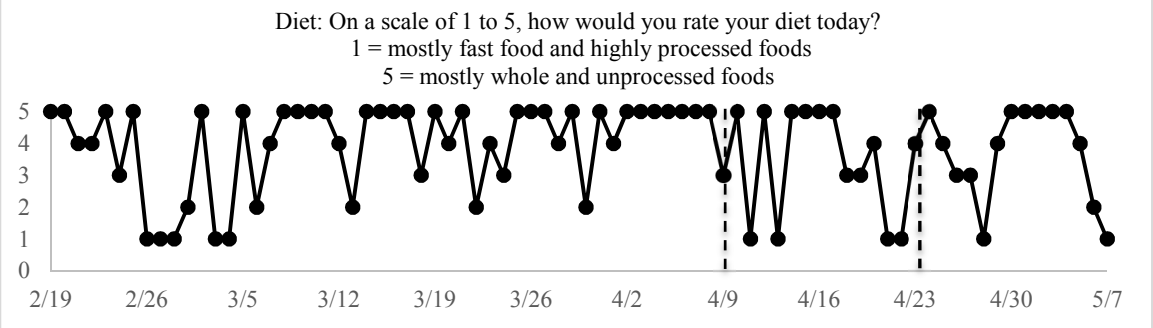
Leena's hours of sleep opportunity varied between 3.5-10 hours during baseline. During the intervention, that range decreased to between 6-9.5 hours, and increased again in the post-intervention period to between 5-11.5 hours per night. Leena's answer to the question assessing mindfulness showed an overall slight increase throughout the study period, a trend that began in

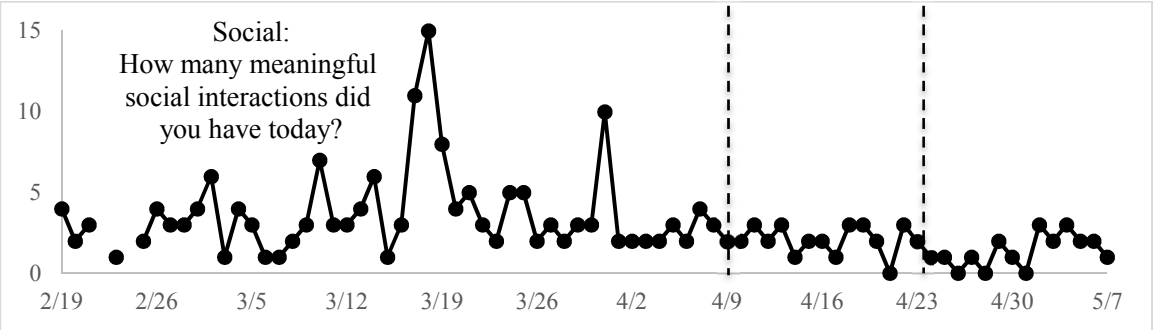
baseline. Her number of meaningful social interactions showed an overall decrease in trend throughout the study period, and she reported feeling more distant from people as the study period went on.

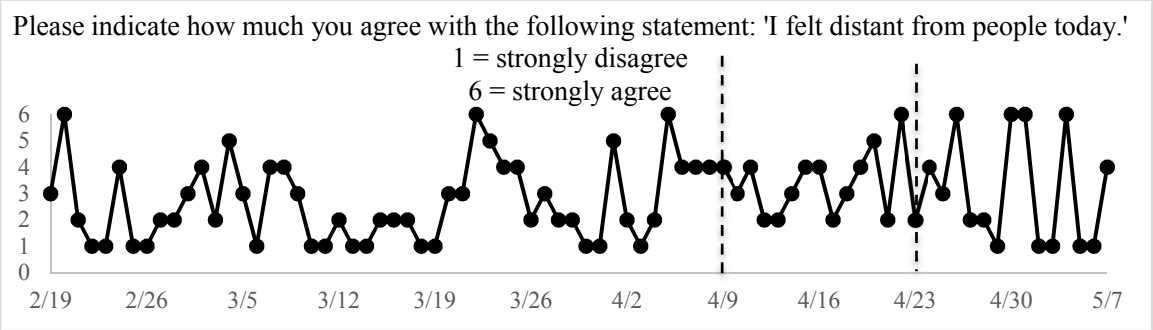






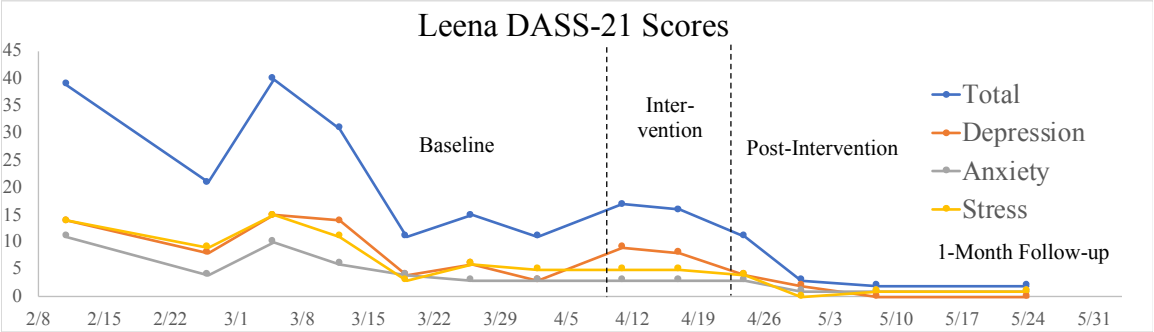






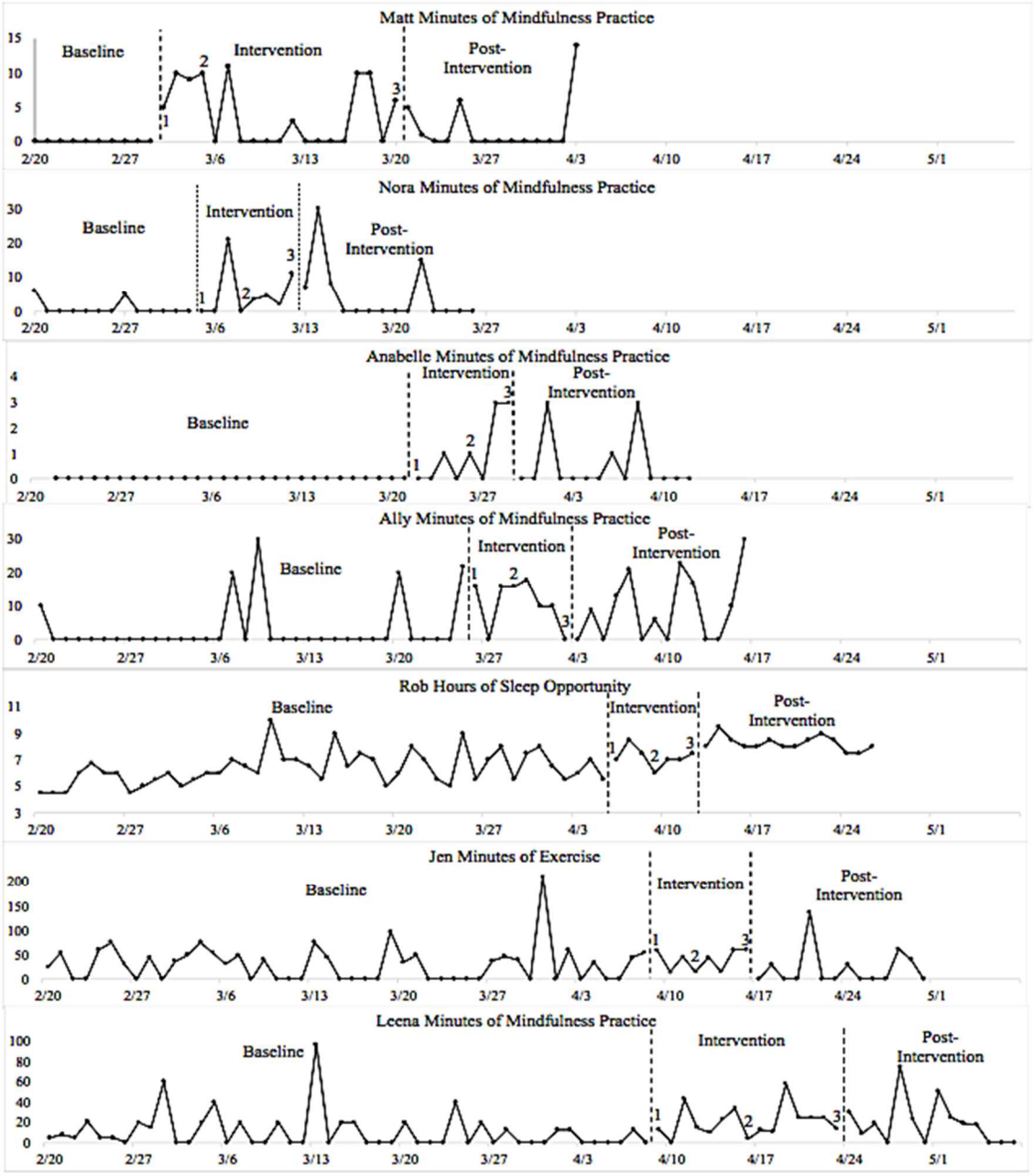
Data analysis: DASS-21 scores.

At screening, Leena endorsed symptoms of extremely severe depression and anxiety and severe stress. Leena's depression and anxiety symptoms fluctuated between extremely severe and normal throughout the baseline period and showed a general decline. Her depressive symptoms stood at moderate during the intervention and dropped to normal at post-intervention and at follow-up. Leena's anxiety symptoms were in the normal range during intervention and remained normal at follow-up. Additionally, her stress symptoms began to decline in the baseline period and were normal at intervention, post-intervention, and at follow-up.



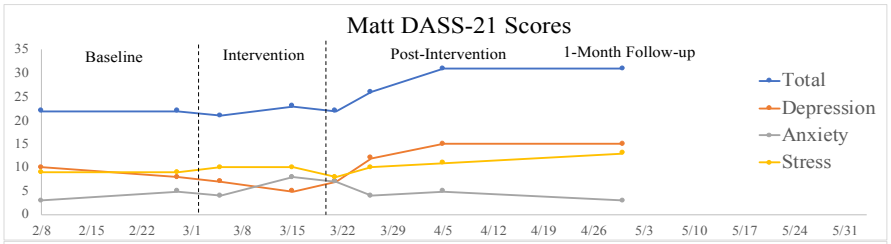
Summary of Idiographic Dependent Variable for all Participants

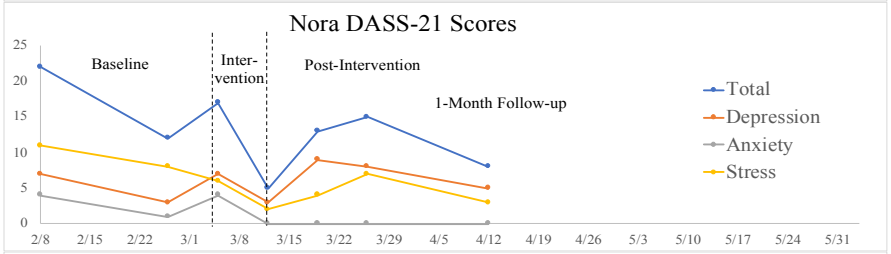
Self-monitoring data for all participants on their idiographic dependent variables are presented in the figure below. Data were analyzed using visual inspection. Five out of seven participants showed increases in self-reported self-care behaviors after the start of the intervention; of those five, three (Anabelle, Ally, and Rob) maintained their gains at the one-month follow up. For two participants (Matt and Nora), their progress diminished in the post-intervention period. For Jen and Leena, there was no meaningful difference in their patterns of responding between any periods of the intervention.

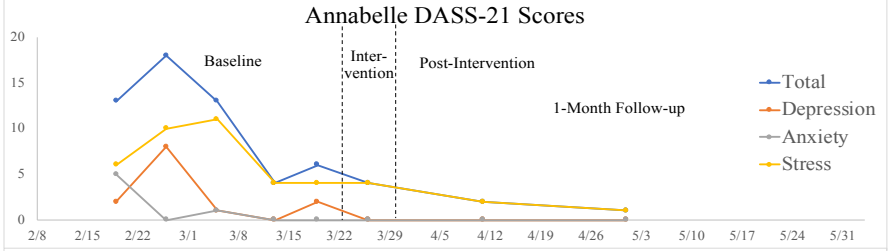


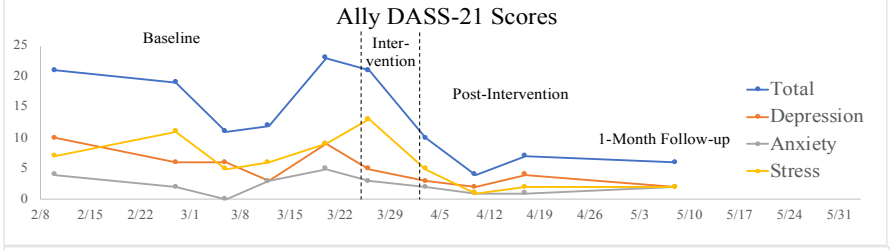
Summary of DASS-21 Scores for all Participants

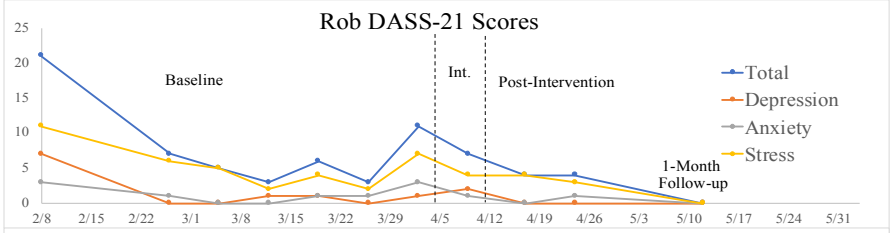
Self-report data for all participants on their levels of stress, anxiety, and depression are presented in the figure below. Six out of seven participants showed overall reductions in distress throughout the study period, trends that generally began in baseline.

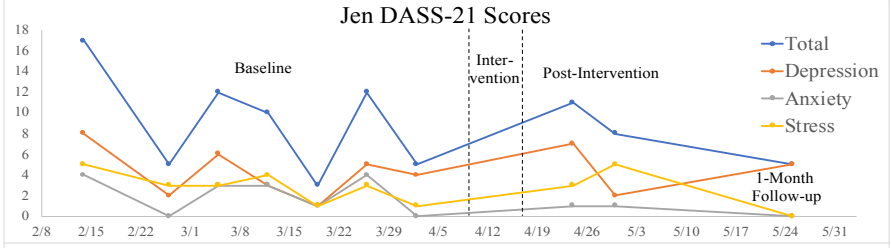

Matt DASS-21 Scores
Baseline
Intervention
Post-Intervention
1-Month Follow-up
Total
Depression
Anxiety
Stress

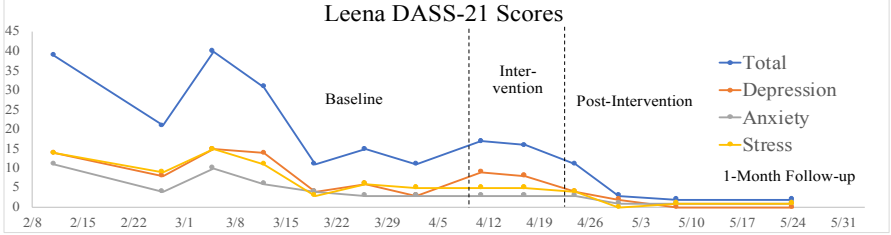

Nora DASS-21 Scores
Baseline
Inter-vention
Post-Intervention
1-Month Follow-up
Total
Depression
Anxiety
Stress


Annabelle DASS-21 Scores
Baseline
Inter-vention
Post-Intervention
1-Month Follow-up
Total
Depression
Anxiety
Stress


Ally DASS-21 Scores
Baseline
Inter-vention
Post-Intervention
1-Month Follow-up
Total
Depression
Anxiety
Stress


Rob DASS-21 Scores
Baseline
Int.
Post-Intervention
1-Month Follow-up
Total
Depression
Anxiety
Stress


Jen DASS-21 Scores
Baseline
Inter-vention
Post-Intervention
1-Month Follow-up
Total
Depression
Anxiety
Stress


Leena DASS-21 Scores
Baseline
Inter-vention
Post-Intervention
1-Month Follow-up
Total
Depression
Anxiety
Stress

IV. DISCUSSION

This study examined the efficacy of a brief three-meeting ACT training focused on self-care in distressed graduate students. We will first discuss the results pertaining to self-reported self-care behaviors, the main research question. We also review how the intervention impacted psychological distress.

ACT Training and Self-care Behaviors (Idiographic Dependent Variable)

This study demonstrated the partial effectiveness of a three-session ACT intervention in a concurrent, multiple baseline, across participants design, where the main dependent measure was self-reported engagement in one self-care behavior of each participant's choice (either mindfulness practice, exercise, or sleep opportunity). The general results of the study can be broken down into three groups:

Intervention Only Responders: Matt, Nora, and Annabelle.

These three participants, who all chose mindfulness practice as their self-care behavior of choice, did little or no mindfulness practice during baseline. At the onset of intervention, they started engaging in their self-care behaviors more regularly – though the absolute number of minutes was quite small. Participants continued to engage in self-care behaviors consistently throughout the intervention (the exception to this is Matt, who went on a weeklong trip to Mexico for spring break in the middle of the intervention, during which he only engaged in mindfulness practice once). During post-intervention, mindfulness practice decreased and became less consistent among all three participants. At follow-up, none of the three reported a regular mindfulness practice where they practiced for 30 minutes at least three days per week.

For this group, the onset of the intervention marked a clear increase in their self-reported rates of mindfulness practice. This indicates that the intervention shows some efficacy at getting people to begin a new behavior – in this case, mindfulness practice. There is some evidence to suggest that psychoeducation on its own produces positive changes in functioning (Chien & Lee, 2013). The psychoeducation about the benefits of mindfulness practice in the first meeting of the intervention could have spurred participants to engage in mindfulness practice.

Regular social contact with the principal investigator during the study period likely motivated the Intervention Only Responders to engage in mindfulness practice. This would explain the drop-off in mindfulness practice during the post-intervention period, as well as the lack of regular mindfulness practice at follow-up. This raises the question of how much long-term change can be brought on by an intervention without an ongoing supportive context. Mindfulness practice might be less reinforcing without the social contingency of attending the intervention meetings and discussing their practice with the principal investigator.

Sporadic Intervention Responders: Ally, Jen, and Leena.

This group showed some level of engagement in their self-care behaviors of choice sporadically during baseline. However, in post-intervention, Jen and Leena went back to baseline levels of exercise and mindfulness practice, while Ally continued showing response patterns similar to the levels she showed during the intervention, with slightly less regularity. Notably, at follow-up, Leena reported having a regular mindfulness practice where she practiced for 30 minutes at least three days per week, but Ally did not. At follow-up, Jen reported that she spent about 30 minutes exercising each day on average over the past week. While this group displayed a generally sporadic response pattern, these results nonetheless highlight the importance of

understanding each case deeply, so as to recognize the variable of impact of intervention, including diverse ways subjects experienced benefit.

The Sporadic Intervention Responders showed some level of engagement in their self-care behaviors during baseline and reported that they wanted their practices to become more consistent. They practiced more regularly – almost daily – during the intervention period. As with the Intervention Only Responders group above, the social contact may have been helpful in regulating their self-care practices, which would explain why their practices became more variable after the intervention ended.

The psychoeducational elements of the intervention could have been helpful in making participants' practices more regular (see Chien & Lee, 2013). In the first intervention meeting, we educated participants about the importance of regularly engaging in their chosen self-care behaviors. This element of psychoeducation may have led the Sporadic Intervention Responders to practice with more regularity and less fluctuation than they showed during baseline. The intervention appeared to be successful in sustaining similar rates of Ally's practice into the post-intervention period (with slightly less regularity). Jen and Leena saw more fluctuations in their chosen self-care behaviors during the post-intervention period compared to the intervention period, similar to their rates of behavior during baseline. Once again, it appears that the social aspect of the intervention could have been helpful for regular engagement in self-care behaviors. This is in line with previous research, which has linked social support to positive health behaviors (Geertsen, 1997; Steptoe, Wardle, Pollard, Canaan, & Davies, 1996). Once the intervention was over – thus ending the social contingencies – the participants generally returned to the patterns they showed in baseline. While the Intervention Only Responders group highlighted the particular challenges of mindfulness practice, this group highlights further questions about social

connection. The two groups together raise questions about larger and contextual interventions as adjuncts to the current intervention.

The Sleep Exception: Rob.

Rob showed a slow and steady increase in his sleep opportunity throughout all phases of the intervention, beginning in baseline. This pattern is remarkably different from the other participants. In particular, Rob was the only participant whose pattern showed a clear increase from the beginning to the end of the baseline period. Research shows that self-monitoring behavior can result in an increase in the monitored behavior (Burke, Wang, & Sevick, 2011; Kazdin, 1974). The mere act of self-monitoring could have produced an increase in Rob's self-reported sleep opportunity during baseline.

Rob was the only participant to choose sleep opportunity as his main self-care behavior. Sleep opportunity is distinct from the other two options – exercise and mindfulness practice. Rob's increase in sleep opportunity may have been due to the straightforwardness of the behavior he was measuring. There is only one way to measure and change sleep opportunity: by monitoring and modifying the amount of time one spends lying in bed with the intention of sleeping. In contrast, there are many different ways to practice mindfulness (e.g. sitting meditation, listening to a guided meditation, mindful walking) and many ways to exercise (e.g. walking, running, cycling, etc.). Additionally, the benefits of sleep may be more readily available and immediately noticeable soon after someone changes their sleeping habits. In contrast, the benefits of mindfulness practice and exercise might take more time to be noticeable after weeks or months of regular patterns of engagement (see Hölzel et al., 2011).

The case of Rob suggests that sleep opportunity can be changed quickly and effectively. However, it also begs the following question: if changing sleep habits was fairly easy to

accomplish in this case, why do we see such profound patterns of sleep deficit in the culture? Over 35% of adults in the United States report getting less than seven hours of sleep per night (Buman et al., 2014). Again, my cases lead me to think about the larger context in conjunction with the psychological context of each of my participants. There is little social support in our culture for healthy sleeping, and there is much reward and admiration for people who defer sleep in favor of working excessive hours. Graduate students in particular have a tendency to wear their lack of sleep as a badge of honor.

The declines in Rob's progress after the study suggest further that the larger social context may be important. While Rob's sleep opportunity increased during each phase of the intervention, he reported averaging only 7 hours of sleep opportunity per night at follow-up. This decrease could indicate that there may have been something reinforcing for Rob about self-monitoring his sleep opportunity every night (see Burke et al., 2011). It is also possible that it was reinforcing for Rob to send in his daily reports of sleep opportunity to the principal investigator, which could explain why his sleep opportunity decreased after the post-intervention period when he was no longer asked to send those reports in. Still, Rob's report of 7 hours of sleep opportunity per night at follow-up is substantially higher than the 4.5 hours he reported at screening.

Overall, the three groups described here suggest the benefits of an ACT-based intervention for increasing self-care in graduate students. However, even this small sample suggests that people want to change, but that support within and beyond the psychoeducational/intervention context merits examination as a strategy for increasing the likelihood of long-term patterns of self-care practice.

ACT Training and Distress

In general, participants' self-reported levels of stress, anxiety, and depression showed substantial reductions from baseline to follow-up. However, these reductions appeared to be part of a trend beginning in baseline, and thus cannot be attributed to the intervention. There are several contextual variables that may play a role in the decrease in self-reported distress.

It's possible that the mere act of signing up to participate in a stress reduction intervention was itself a form of stress reduction for participants. Perhaps signing up for the study was akin to booking a massage; participants may have been soothed by the idea that they soon would participate in a program that promised to lower their stress levels. This knowledge on its own could have played a role in lowering distress.

Additionally, the study triggered participants to engage in self-monitoring right from the beginning. Research has suggested that self-monitoring may play a role in decreasing distress (Kauer et al., 2012). Perhaps self-monitoring their behaviors led to increased self-awareness, leading to a decrease in distress among participants. This explanation is consistent with Kauer et al. (2012), where they showed that self-monitoring on its own produced increases in emotional self-awareness and decreases in self-reported depressive symptoms in distressed adolescents.

Another context is the time in the academic calendar when the study was conducted. The study period began in early-to-mid February for all participants – 2-4 weeks into Spring semester, which tends to be a hectic time for graduate students since they are adjusting to their somewhat new schedules while midterms are fast approaching. Therefore, it's reasonable to hypothesize that distress levels among grad students are higher during this time. Then, as students adjust to their classes and schedules, their distress might decrease over time. By the one-month follow-up timepoint, the semester had ended or was about to end, with a long break to

follow, which is an arguably less distressing time for graduate students than the beginning of the study.

Limitations and Future Directions

Participant Demographics.

One limitation of the present study is that participants were a convenience sample of graduate students that consisted primarily (i.e. over half) of Caucasian females. In order to generalize the findings to the broader population of graduate students, future studies should include more male participants and participants of different ethnicities.

Acceptability Data.

Collecting acceptability data is a way of evaluating the social validity of behavioral interventions (Wolf, 1978). Social validity can be defined as the degree to which an intervention is valued by consumers (Hurley, 2012). Research suggests that measures of social acceptability may be related to participants' level of engagement in the recommended behaviors of an intervention (Langthorne & McGill, 2011). In the present study, we did not assess how acceptable participants found the intervention to be. Future studies should include a measure of acceptability (e.g. Hunsley, 1992), which would provide valuable information about how participants view their experiences participating in research studies. Although we didn't specifically ask about social acceptability, it is worth noting that we had 100% retention in our study. All participants attended all scheduled appointments, without a single cancelation or even rescheduled appointment.

Self-monitoring Effect.

Research has shown that self-monitoring a behavior may alter the frequency of that behavior (Burke et al., 2011; Kazdin, 1974). Thus, when participants started to keep track of

their self-care behaviors in baseline, this act of self-monitoring could have influenced their level of engagement in self-care behaviors. Future research should control for the self-monitoring effect when assessing self-care behaviors. For example, an intervention designed to increase exercise could keep track of the amount of time participants spend at the gym by giving each participant a card that they must use to swipe in and out of the gym. Half of the participants could be asked to self-monitor the amount of time they spend exercising, and the other half would not be asked to self-monitor. Then, these two groups could be compared to see if the amount of time spent exercising differed between the self-monitoring group and the control group.

Similarly, a study designed to increase sleep opportunity could give all participants an actigraph to automatically keep track of their sleep. Half of these participants could additionally be asked to self-monitor their sleep using Sleep Cycle. The two groups could be compared to see if the amount of sleep opportunity differed between the self-monitoring group and the control group.

Initial Meeting as Intervention.

It is possible that the initial meeting functioned as an intervention of sorts, even though it was not meant to be part of the actual intervention. Every participant was required to come in for an initial meeting before beginning their self-monitoring. During this meeting, participants were given education about what constitutes each area of self-care and how to monitor their self-care behaviors. They were also able to ask any questions they had. Even just learning about what constitutes self-care could have influenced their level of engagement in each self-care behavior during the baseline period. Future research could address this issue by including a control

group that only receives the initial meeting followed by a period of monitoring their self-care behaviors without receiving the intervention.

Incorporating Social Reinforcement.

As mentioned earlier, the social component of the intervention (i.e. discussing self-care behaviors with the principal investigator) could have been useful for participants in beginning their self-care practices. There is evidence to suggest that social support is important for behavior change outcomes (Geertsen, 1997; Steptoe et al., 1996). There are several ways to test the efficacy of social contingencies in future studies.

Research could address the value of face-to-face versus online interventions. A study could be conducted in which the same self-care information is delivered to two different groups in two different ways. The first group would receive the information in person, much like the current study. The second group would receive the same information from an online tutorial. Both groups would self-monitor their self-care behaviors, and the two groups would be contrasted at the end of the study to see if there were any differences in reported levels of self-care behaviors between the two groups.

Additionally, it would be worthwhile to administer the intervention in group format. Engaging in self-care behaviors in a group would give the participants a chance to form bonds with other graduate students who are all working towards the same goal. This could happen in structured groups, or in interest groups such as community meditation groups. Being in a supportive community could be especially helpful for starting a mindfulness practice, where the benefits might take time to be noticeable. Studies suggest that mindfulness practice can be difficult to sustain over time (Rowe, Shepstone, Carnelley, Cavanagh, & Millings, 2016). Community resources—which can be simple and low cost—could multiply and extend the

benefits of practicing. Within the Buddhist spiritual tradition lies the notion of sangha, a Sanskrit word, which is translated to mean "community" (Lauricella, 2014). In western cultures, sangha refers to a group of spiritually minded individuals who practice meditating together (Lauricella, 2014). There is some evidence suggesting that sangha may be important for individuals who are beginning a meditation practice (Lauricella, 2014). Future research should consider directing participants towards community resources such as free meditation groups.

Mindfulness Practice Interventions.

In the current study, the instructions for how to practice mindfulness were very flexible and, as a consequence, potentially vague. Participants were given a general definition of what constitutes mindfulness practice as well as several examples of ways in which they could practice (e.g. sitting meditation, guided meditation, walking meditation). They were not instructed to practice in any particular way – they were encouraged to try out different methods of practice to see what worked for them. This approach offered great flexibility; however, it was nonspecific and thus potentially confusing to participants.

Future studies might consider teaching a more specific method of mindfulness practice. For example, Mindfulness-Based Stress Reduction (MBSR) has been shown to have positive emotional effects for graduate students (Barbosa et al., 2013; Song & Lindquist, 2015). MBSR is a highly popular, replicated approach to stress reduction. It consists of eight weekly classes teaching basic meditation and breathing techniques, in addition to homework assignments involving meditation practice six days per week. It's worth seeing whether graduate students who undergo MBSR training are more likely to continue practicing on their own after the training is over.

Target Intervention Towards Sleep Opportunity.

The current study shows promise as an effective intervention for increasing sleep opportunity, as evidenced by Rob's positive results. Future research should examine the effectiveness of the intervention in more participants who have the goal of increasing their sleep opportunity.

Length of Intervention.

The intervention in the current study included three meetings over a two-week period of time. During the intervention period, most of the participants showed increases in their self-care behaviors or showed more regularity in practicing these behaviors. However, these gains did not last for most participants after the intervention period had ended. Future studies might consider increasing the length of the intervention to include more strategies and tools designed to increase maintenance of self-care behaviors after the end of the intervention.

Time in the Semester.

Future studies should vary the time in the semester that the intervention takes place, in order to control for times in the semester that tend to be more stressful for students (i.e. midterms, finals).

What it all means and where do we go from here?

Graduate students experience high rates of mental health difficulties and low rates of self-care behaviors (Garcia-Williams et al., 2014; Melnyk et al., 2016; Myers et al., 2012). At the same time, self-care behaviors such as exercise and sleep are important for wellbeing (Gu et al., 2017; Mullan, 2014). Graduate students are particularly ripe—as young strivers in a new endeavor—for neglecting such things. Additionally, evidence is mounting that social support and mindfulness practice lead to positive mental health outcomes (Lee & Goldstein, 2016; Vøllestad et al., 2012). ACT interventions are effective for a wide range of difficulties for individuals in

both clinical and non-clinical populations, and show promise as a method for increasing self-care behaviors (Brinkborg et al., 2011; Gregg et al., 2007; Ivanova, Yaakoba-Zohar, Jensen, Cassoff, & Knäuper, 2016).

We conducted a study using a brief ACT-based intervention in distressed graduate students interested in improving their self-care behaviors. We predicted that the intervention would increase self-care behaviors among the participants. The results were mixed and led to questions about how to contextualize the approach—to broaden the scope of where and how reinforcement occurs. The current study—though modest—contributes to the existing literature (see Ivanova et al., 2016) suggesting that ACT shows promise for increasing willingness to engage in self-care behaviors.

This study marks the first attempt to date of evaluating a brief ACT intervention to increase self-care in distressed graduate students. As I evaluated each of my cases, and found them falling into subgroups, an important theme helped me to connect them all: to look for ways to use ACT and psychoeducational approaches in conjunction with understanding clients in their larger context. The findings of this study raise the following question: how might ACT be best implemented to increase self-care behaviors in distressed graduate students?

Bridging the Clinical/Research Gap

The existing data suggest the potential utility of using ACT to increase self-care behaviors in graduate students, yet more research is needed to determine the most effective way to create self-care habits that are sustainable over the long term. One strength of the current study is that it could be conducted in clinical settings. Future research could be designed and implemented in clinical settings (e.g. counseling centers, private practices) to determine which elements of the intervention are the most helpful for increasing self-care behaviors. For example,

clinicians could vary the length of the intervention to see if a longer intervention period would yield better outcomes.

Clinicians could also vary the dosage of self-care targets for their clients to see if a higher dose is more effective for creating regular practices of self-care. In the current study, we allowed participants to start off with very low doses of self-care behavioral targets (e.g. Annabelle's target of 1-5 minutes of mindfulness practice per day). Such low doses of self-care practices may not have been reinforcing enough to continue past the intervention period. In clinical practice, therapists could vary the dosages of self-care and test them out over a longer period of time than the current intervention allowed. They could also include follow-up periods that are longer than 2 weeks past the intervention – perhaps 6 months or a year.

We are still in the early stages of exploring what is most beneficial for increasing self-care and lowering distress in graduate students. This area is a worthwhile avenue to continue investigating given the high rates of distress reported by graduate students. The current study contributes to the existing literature in this area, indicating that a brief ACT intervention could be useful for increasing self-care behaviors in distressed graduate students.

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APPENDICES

Table 1. Descriptive Statistics of Participants (*n*=7)

	Matt	Nora	Anna	Ally	Rob	Jen	Leena
Gender	M	F	F	F	M	F	F
Marital Status	M	S	S	S	M	S	M
Age	31	27	22	23	38	26	33
Year in graduate school	3	3	1	1	1	1	2
Ethnicity	C	C	C	C	O	C	C

M = Married, S = Single
C = Caucasian, O = Other

Appendix A

Description of Intervention Meetings

Meeting 1

- Exercise: Interview using the Matrix (Polk & Schoendorff, 2014)
    - Identify unwanted private experience.
        - Describe unwanted thoughts (e.g. “no one likes me”, “what if I don’t succeed in my graduate program”)
        - Describe unwanted physical sensations (e.g. pounding heart, muscle tension)
        - Describe unwanted emotions (e.g. sadness, shame, anxiety)
    - Identify coping strategies along with short and long-term workability.
        - Identify any behaviors that they engaged in in order to cope with their unwanted inner experiences (e.g. isolating oneself, drinking, overworking)
        - Invitation to evaluate the workability of coping strategies (i.e. “how helpful has this behavior been for you over the short-term? How helpful has it been over the long-term?”)
    - Identify values and behaviors that relate to values.
        - Identify most strongly held values (i.e. “what/who is most meaningful to you?”)

        - Identify behaviors that relate to those values ("what behaviors do you engage in regularly that relate to your values?")
- Committed Action targets related to idiographic dependent variable
    - Describe how engaging in idiographic DV could be helpful for your values.
    - Identify daily target goals for engagement in chosen area of self-care (i.e. "what are some small self-care practices that you want to engage in between now and our next meeting that would move you in the direction of your values?")

Meeting 2:

- Exercise: 5-minute general mindfulness practice (5 minutes)
    - Invitation to become aware of breathing and practice non-judgmental awareness of current physical sensations, thoughts, and emotions.
- Reflect on self-care practice
    - Identify any unwanted inner experiences that arose between the first and second meetings, particularly those that they felt got in the way of engaging in their chosen self-care practices (e.g. fatigue, feelings of not wanting to practice, "I don't have time", etc.)
    - Describe any self-critical thoughts and feelings that came up in those hard moments, as well as how they related to themselves (i.e. "when you notice yourself having this difficult experience, how do you relate to yourself?").
- Exercise: Self-compassion, Mindfulness and Perspective-Taking
    - Close your eyes and bring to mind a moment in the recent past when you experienced some sort of distress. Notice what your attitude is like towards

yourself during this difficult experience. Notice any self-judgments or self-criticisms you have.

    - Imagine face of a loved one who is young, or imagine your own face as a young child
    - Imagine that that child were to come up to you and describe having the very same difficult experience that you just described.
    - Notice how you would relate to this child. Notice any differences between your attitude towards the child and your attitude towards yourself when you had the same difficult experience.
    - Imagine what you would offer the child in that moment.
    - Imagine what it would look like if you offered yourself something kind during difficult experiences, the same way you would offer kindness towards a child who you love deeply (e.g. "What would you offer yourself on your bravest day?" "What would you offer yourself on your kindest day?").

- Debrief exercise
    - Describe any inner experiences that came up during the exercise.
    - Describe any reservations you have about offering yourself kindness and compassion.
    - Invitation to describe what it might look like to offer yourself kindness during hard moments.
- Recommit to self-care practice
    - Modify any committed action targets related to self-care as needed

- Identify specific self-care practices to commit to engaging in between the second and third meetings.

Meeting 3:

- Assess for any unwanted inner experience which occurred since the study began
- Exercise: "Leaves on a Stream" (Hayes et al., 2011)
- Debrief exercise
  - Ask participant what happens when they take orders from their thoughts (e.g. "does obeying your thoughts lead to your world being more open or narrower?").
  - Describe any thoughts that interfere with self-care practice
  - Invitation to let go of the struggle with thoughts, and to look at thoughts for what they are: a constellation of inner experiences that are constantly changing.
- Orient participant back to values
- Recommit to self-care practice
  - Set specific practice goals for the next week and beyond

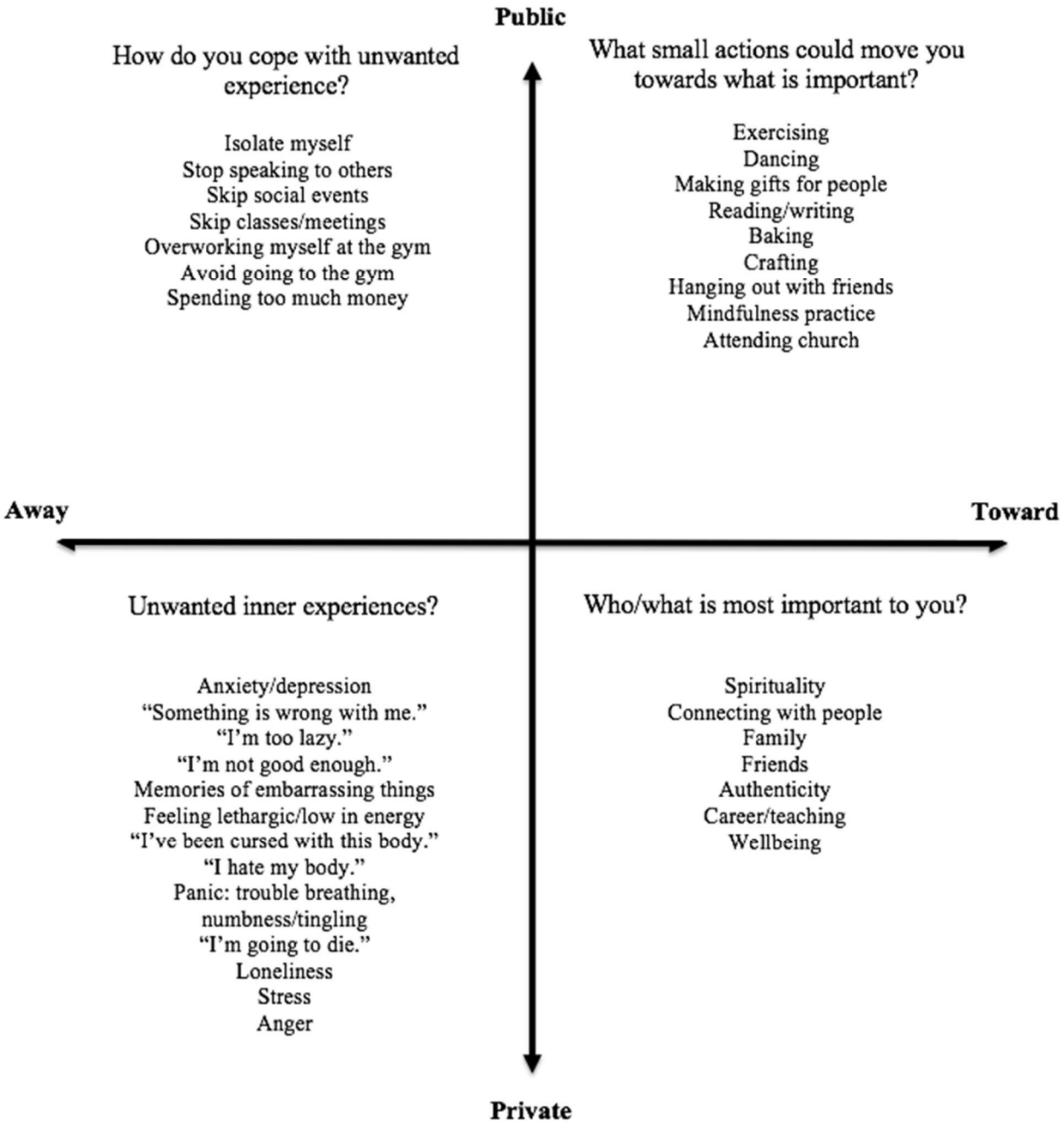
Appendix B

"Leaves on a Stream" Exercise

Sit in a comfortable position and either close your eyes or rest them gently on a fixed spot in the room. Visualize yourself sitting beside a gently flowing stream with leaves floating along the surface of the water. *Pause 10 seconds.* For the next few minutes, take each thought that enters your mind and place it on a leaf… let it float by. Do this with each thought – pleasurable, painful, or neutral. Even if you have joyous or enthusiastic thoughts, place them on a leaf and let them float by. If your thoughts momentarily stop, continue to watch the stream. Sooner or later, your thoughts will start up again. *Pause 20 seconds.* Allow the stream to flow at its own pace. Don't try to speed it up and rush your thoughts along. You're not trying to rush the leaves along or "get rid" of your thoughts. You are allowing them to come and go at their own pace. If your mind says "This is dumb," "I'm bored," or "I'm not doing this right" place *those thoughts* on leaves, too, and let them pass. *Pause 20 seconds.* If a leaf gets stuck, allow it to hang around until it's ready to float by. If the thought comes up again, watch it float by another time. *Pause 20 seconds.* If a difficult or painful feeling arises, simply acknowledge it. Say to yourself, "I notice myself having a feeling of boredom/impatience/frustration." Place those thoughts on leaves and allow them float along. From time to time, your thoughts may hook you and distract you from being fully present in this exercise. This is *normal.* As soon as you realize that you have become sidetracked, gently bring your attention back to the visualization exercise.

Appendix C

Example of the Matrix Interview



VITA

Curriculum Vitae

Emily H. K. Jacobson

Education

Doctor of Philosophy, Clinical Psychology (expected May 2019)
University of Mississippi, Oxford, MS (APA-accredited)
Dissertation (Proposed: September 2017): A Brief ACT-Based Intervention for Distressed Graduate Students
Chair: Kelly G. Wilson, PhD.

Master of Arts, Clinical Psychology (May 2016)
University of Mississippi, Oxford, MS (APA-accredited)
Thesis: Investigating the Relation Between Self-Compassion and Romantic Relationships
Chair: Kelly G. Wilson, PhD.

Bachelor of Arts (January 2009)
Oberlin College of Arts & Sciences, Oberlin, OH
Double Major: English and Sociology

Licenses/Certifications

Provisionally Certified Mental Health Therapist (Jurisdiction: MS)
Examination for Professional Practice in Psychology (EPPP)
Passed at the Doctoral Level: February 2017

Clinical Experience

Pre-Doctoral Psychology Intern (August 2018-present)
Corporal Michael J. Crescenz Veterans Affairs Medical Center (Philadelphia VAMC)
APA Accredited Internship Program (40 hrs/week)
Philadelphia, PA

Spring 2019 Rotations (Two 6-month rotations): (February 2019 - August 2019)

Setting: PTSD Clinical Team (PCT)

Duties: Will provide individual and group psychotherapy for Veterans exposed to a wide range of traumatic events including combat trauma, military sexual trauma, and childhood abuse. Treatment will initially focus on forming a trusting therapeutic relationship, stability, safety, and reducing self-harm behaviors, followed by protocols intended to address past traumatic experiences and meaningful life goals. Will also co-lead groups for Veterans with trauma histories that may include MST, STAIR, or Dialectical Behavior Therapy groups.
Supervisors: Susan DelMaestro, PhD, and Marta MacDougall, PsyD.

Setting: Sleep Clinic
Duties: Will provide detailed assessments and evidence-based interventions for Veterans with sleep problems and disorders, including cognitive behavioral therapy for insomnia (CBT-I) and imagery rehearsal therapy (IRT).
Supervisor: Philip Gehrman, PhD.

Fall 2018 Rotations (Two 6-month rotations): (August 2018-February 2019)

Settings: Evidence-Based Psychotherapies
Duties: Providing individual treatment to Veterans including Cognitive Behavioral Therapy for Depression (CBT-D) and Prolonged Exposure (PE), as well as other evidence-based psychotherapies for panic disorder, trichtillomania, social phobia, and OCD. Completing evidence-based assessment for each individual prior to treatment including the M.I.N.I. clinical interview, CAPS interview, PHQ-9, PCL-5, and other disorder-specific measures.
Supervisor: Jason Goodson, PhD.

Settings: Health Promotion Disease Prevention (HPDP)
Duties: Working as part of a healthcare team focused on delivering treatments intended to reduce unhealthy behaviors (e.g. tobacco use, diet, stress, exercise) in order to decrease the burden of chronic disease. Leading groups including Weight Management (MOVE! Program), Stress Management, Progressive Tinnitus Management, and Stop Smoking, and providing individual treatments for Veterans coping with chronic illnesses (i.e. GI disorders, diabetes). Utilizing Motivational Interviewing and Cognitive Behavioral Therapy techniques in order to faciliate behavior change.
Supervisor: Erin W. Ulloa, PhD.

Year-long Rotations:

Psychological Assessment:
Setting: Mental Health Clinic
Duties: Conducting clinical interviews and neuropsychological batteries focused on assessing cognitive functioning in Veterans with conditions such as Parkinson's Disease and traumatic brain injury (TBI).
Supervisors: Solomon Kalkstein, PhD, and Cobb J. Scott, PhD.

Long-term Therapy Rotation:
Setting: Couples Therapy Clinic
Duties: Providing Integrative Behavioral Couple Therapy (IBCT) to 6-8 couples per week. Training includes weekly supervision and a 4-month seminar in IBCT.
Supervisors: Steven L. Sayers, PhD.

University of Mississippi: Graduate Therapist (May 2014-May 2018)
Psychological Services Center
Oxford, MS

Duties included conducting intake interviews, developing treatment plans, and providing individual therapy for clients presenting with anxiety, mood, personality, neurodevelopmental, and substance use disorders.
Supervisors: Kelly G. Wilson, PhD, Alan M. Gross, PhD, Todd A. Smitherman, PhD, Scott Gustafson, PhD, and Laura Dixon, PhD.

University of Mississippi: Graduate Assessor (May 2015-May 2018)
Psychological Assessment Clinic
Oxford, MS

Duties included conducting comprehensive psychological evaluations with integrative reports for learning disabilities, Attention-Deficit/Hyperactivity Disorder, mood/anxiety disorders, and personality disorders.
Supervisors: Shannon Sharp, PhD, and Scott Gustafson, PhD.

University of Mississippi: Graduate Therapist (July 2016-June 2017)
Communicare: Community Mental Health Center
Pittsboro, MS

Duties included conducting intake assessments, developing treatment plans, completing paperwork, and providing individual and group therapy to underserved and rural clients presenting with conditions such as Schizophrenia, Major Depressive Disorder, and Posttraumatic Stress Disorder.
Supervisors: Dixie Church, LMFT, and Todd A. Smitherman, PhD.

University of Mississippi: Graduate Therapist **(**August 2015-May 2016)
University Counseling Center
Oxford, MS

Duties included conducting initial assessment interviews, assessing for psychological disorders, developing treatment plans, and providing individual therapy for college student clients presenting with relationship difficulties as well as disorders including Adjustment Disorder, Posttraumatic Stress Disorder, Social Anxiety Disorder, and Major Depressive Disorder.
Supervisors: Joshua Magruder, PhD, and Quinton Edwards, PhD.

University of Mississippi: Graduate Intern (July 2014-July 2015)
Department of Education and Research, The Baddour Center
Senatobia, MS

Duties included providing individual therapy to adults with intellectual disabilities, conducting functional behavior assessments, developing behavior management plans, and leading a women's support group, as well as conducting assessments evaluating intellectual functioning, adaptive behavior, and dementia.
Supervisor: Shannon L. Hill, PhD.

Patient Care Coordinator (March 2012-August 2012)
Seattle Neuropsychiatric Treatment Center
Seattle, WA

Duties included managing patient care for a psychiatry group providing outpatient and inpatient treatment to adults diagnosed with treatment-resistant major depression, providing education to patients and their families regarding treatment options, and serving as a facilitator for communication and coordination of care between patients, clinic psychiatrists, and other outside providers. Duties also included administering mental health status exams, cognitive tests, and clinical rating scales for depression, and facilitating laboratory tests and referrals to outside care providers.
Supervisors: Kenneth Melman, MD, Christopher Famy, MD.

Crisis Hotline Phone Worker (August 2010-December 2011)
King County Clinic
Seattle, WA

Duties included providing crisis intervention services and supportive counseling to callers experiencing suicidal ideation and other emotional distress, including problem-solving and exploring coping strategies. Over 55 hours of professional training and 60 hours working on the phone lines.
Supervisor: Brannon Mark.

Supervision Experience

University of Mississippi: Peer Supervisor (August 2016-May 2018)
Psychological Services Center: ACT practicum team
Oxford, MS

Provided peer supervision to graduate students enrolled in the Acceptance and Commitment Therapy (ACT) practicum team.
Supervisor: Kelly Wilson, PhD.

University of Mississippi: Supervisor (August 2017-December 2017)
Psychology 721: Evidence Based Services
Oxford, MS

Enrolled in a seminar that focused on learning and practicing core competencies in clinical supervision. Class activities included reading literature about clinical supervision and providing weekly supervision and didactic instruction to second-year and third-year clinical psychology graduate students. Supervision meetings focused on assisting with case conceptualization and treatment planning from a cognitive-behavioral perspective.
Instructor: John Young, PhD.

Research Experience

University of Mississippi: Graduate Research Assistant **(**August 2013-May 2018)
Mississippi Center for Contextual Psychology
Oxford, MS

Duties included assisting with all aspects of running an active research lab, including recruiting participants for research studies, lab scheduling, IRB preparation, analyzing and interpreting data, providing ad hoc reviews of literature, and overseeing undergraduate research assistants.
Supervisors: Kelly G. Wilson, PhD, Kate Kellum, PhD.

Northwestern University Feinberg School of Medicine: Research Assistant (September 2012 -August 2013)
Affective Science and Treatment Laboratory
Chicago, IL

Duties included phone screening potential study participants using the Structured Clinical Interview for DSM Disorders (SCID), assisting with recruitment, and managing data in SPSS.
Supervisor: Jacqueline K. Gollan, PhD.

University of Washington: Research Coordinator **(**December 2009-August 2012)
Functional Analytic Psychotherapy Research Lab

Duties included preparing IRB applications, coding psychotherapy tapes, assisting with grant preparation, overseeing research assistants, administering interventions, managing data in SPSS, writing literature reviews, and developing treatment protocols for research studies.
Supervisors: Robert Kohlenberg, PhD, and Mavis Tsai, PhD.

SPAFF Coder & Research Assistant **(**June 2010-September 2011)
Relationship Research Institute
Seattle, WA

Duties included providing reliable, accurate data coding using the Specific Affect Coding System (SPAFF) to analyze problem-solving couple interactions. Training consisted of an intensive three-month class on SPAFF, which included Paul Ekman's Facial Action Coding System. Achieved inter-rater reliability to code over 80 hours of tapes.
Supervisors: John Gottman, PhD, and Kaeleen Drummey.

Teaching Experience

University of Mississippi: Teaching Assistant **(**August 2017-December 2017)
Psychology 505: Learning and Conditioning
Oxford, MS

Duties included assisting with all aspects of running a graduate level class, including attending weekly lectures, leading study sessions, grading tests and quizzes, and managing grades online.
Instructor: Kelly G. Wilson, PhD.

University of Mississippi: Teaching Assistant **(**January 2014-May 2014)
Psychology 309: Learning and Conditioning
Oxford, MS

Duties included assisting with all aspects of running an undergraduate class, including grading, creating tests and quizzes, maintaining grade records, and leading study sessions.
Instructor: Kelly G. Wilson, PhD.

University of Mississippi: Teaching Assistant **(**August 2013-December 2013)
Psychology 311: Abnormal Psychology
Oxford, MS

Duties included assisting with all aspects of running an undergraduate class, including grading, creating tests and quizzes, maintaining grade records, and leading study sessions.
Instructor: Kelly G. Wilson, PhD.

University of Washington: Teaching Assistant **(**December 2010-March 2011)
Psychology 489: Clinical Psychology
Seattle, WA

Duties included assisting with all aspects of running an undergraduate senior-level class, including grading exams, maintaining grade records, and holding office hours with students to review class material.
Instructor: Robert Kohlenberg, PhD.

Publications

Peer-reviewed:

Jacobson, E. H. K., Wilson, K. G., Kurz, A. S., & Kellum, K. K. (2018). Examining self-compassion in romantic relationships. *Journal of Contextual Behavioral Science*, *8*, 69-73.

Holman, G. I., Kohlenberg, R. J., & Tsai, M, Haworth, K., **Jacobson, E. H. K.**, & Liu, S. (2012). Functional Analytic Psychotherapy is a framework for implementing evidence-based practices: The example of integrated smoking cessation and depression treatment. *International Journal of Behavioral Consultation and Therapy, 7,* 58-62.

Presentations

Jacobson, E. H. K., Kurz, A. S., Hebert, E. R., Kellum, K. K. & Wilson, K. G. (May 2015). *Early bird gets the A: Is GPA related to when in the semester students participate in research studies and does it matter?* Paper presented at the annual convention of the Association for Behavior Analysis International, San Antonio, TX.

Jacobson, E. H. K., Wilson, K. G., Kellum, K. K. (March 2015). *Investigating the relation between self-compassion and romantic relationships.* Paper presented at the Southeastern Chapter of the Association for Contextual Behavioral Science Conference, Lafayette, LA.

Kurz, A. S., **Jacobson, E. H. K.**, Herbert, E. R., Kellum, K. K., & Wilson, K. G. (March 2015). *Is questionnaire performance related to when in the semester students participate in research studies?* Poster presented at the Southeast Chapter of the Association for Contextual Behavioral Science Conference, Lafayette, LA.

Jacobson, E. H. K., Hebert, E. R., Kurz, A. S., Wilson, K. G. & Kellum, K. K. (June 2014). *Investigating the relation between self-compassion and values-based action in a sample of college students.* Paper presented at the Association for Contextual Behavioral Science World Conference XII, Minneapolis, MN.

Jacobson, E. H. K., Holman, G. I., Haworth, K., Kohlenberg, R. J., & Dimidjian, S. (November 2010).

Remission of anxiety disorders following treatment for depression. Poster presented at the Association for Behavioral and Cognitive Therapies 44th Annual Convention, San Francisco, CA.

Haworth, K., Holman, G. I., **Jacobson, E. H. K.**, Kohlenberg, R. J., & Dimidjian, S. (November 2010).

Which items on the hamilton rating scale of depression change after treatment? A comparison of antidepressant medication and psychotherapy. Poster presented at the Association for Behavioral and Cognitive Therapies 44th Annual Convention, San Francisco, CA.

Workshops and Trainings

Co-Facilitator, Values Work, Self-Care, and Self-Compassion in a Stressed Out World, conducted by Wilson, K.G., **Jacobson, E. H. K.**, Hebert, E. R., Bhambhani, Y., & Kurz, A. S. at the annual meeting of the Association for Contextual Behavioral Science in Seattle, WA, June 2016.

Co-Facilitator, An Experiential Introduction to Acceptance and Commitment Therapy, conducted by Wilson, K.G., **Jacobson, E. H. K.**, Hebert, E. R., Bhambhani, Y., & Kurz, A. S. at the annual meeting of the Association for Contextual Behavioral Science in Minneapolis, MN, June 2014.

Attendee, Integrative Behavioral Couple Therapy (IBCT) Clinician Training, conducted by Andrew Christensen, PhD in Memphis, TN, May 2016.

Attendee, Acceptance and Commitment Therapy Boot Camp, conducted Kelly Wilson, PhD, Steven Hayes, PhD, Benji Schoendorff, PhD, Marie-France Bolduc, PhD, Jacque Pistorello, PhD, Patty Bach, PhD, Aki Masuda, PhD, Tim Weil, PhD, Emily Sandoz, PhD, & Josh Pritchard, PhD, in Orlando, FL, September 2013

Attendee, Functional Analytic Psychotherapy Level II Workshop, conducted by Robert Kohlenberg, PhD, & Mavis Tsai, PhD, in Seattle, WA, June 2012.

Attendee, Move Your Life: Exploring the Synergy between Acceptance and Commitment Therapy and Mindful Yoga Practice, conducted by Kelly Wilson, PhD, in Boulder, CO, February 2012.

Administrative Experience

University of Mississippi: Assistant to the Director of Clinical Training (June 2017-May 2018)
Oxford, MS

Duties included assisting the Director of Clinical Training in the day-to-day operations of the clinical graduate program, assisting with record-keeping and management pursuant to APA accreditation, mentoring first-year graduate students, and planning and executing the clinical program's interview weekend.
Supervisors: Todd A. Smitherman, PhD.

Ad Hoc Reviewer

Journal of Contextual Behavioral Science

Professional Affiliations

Association for Behavior Analysis International
Association for Contextual Behavioral Science
Association for Behavioral and Cognitive Therapies