

2023

The Relationship Between Loneliness and Experiential avoidance after Implementation of a Self-Compassion Intervention

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ABSTRACT

THE RELATIONSHIP BETWEEN LONELINESS AND EXPERIENTIAL AVOIDANCE AFTER IMPLEMENTATION OF A SELF-COMPASSION INTERVENTION

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An individual's perception of a social relationship is distinct from an individual's difficulty forming and maintaining social relationships. Loneliness is defined as an individual's distress resulting from the discrepancy between perceived and desired social relationship quality. In the short term, loneliness may act as a motivator for an individual to seek social support to minimize distress. However, long-term loneliness is associated with physical and psychological impairments. There have been several risk factors identified that contribute to chronic loneliness, such as social isolation, psychopathology, and ineffective coping strategies. Ineffective coping may be one mechanism by which loneliness is associated with psychopathology (e.g., depression, anxiety, posttraumatic stress disorder [PTSD]). One example of ineffective coping is experiential avoidance (EA), an unwillingness to remain in discomfort. Individuals with high levels of loneliness also report high levels of EA. An effective intervention for EA incorporates learning about and implementing approach behaviors through mindfulness. Teoh et al. conducted a meta-analysis examining the effectiveness of mindfulness interventions on loneliness. Results indicated that the intervention with the strongest effect was cognitive behavioral compassion therapy, which improved self-compassion within young adult populations. There is a gap in the literature examining whether a brief, self-guided self-compassion intervention may also

effectively reduce EA and loneliness. The current study addressed this gap by comparing outcomes between a condition that completed a three-day self-guided self-compassion intervention to a control condition that completed a progressive muscle relaxation exercise to examine the relationship between EA and loneliness within undergraduate students ($N = 104$, $M_{\text{age}} = 19.09$). Participants completed baseline questionnaires before participating in either a self-guided self-compassion mindfulness audio recording (intervention condition) or progressive muscle relaxation audio recording (control condition) for three consecutive days. Participants then completed post-intervention questionnaires one-week after completion of the baseline measures. Analyses indicated that when controlling for psychopathology (i.e., depression, anxiety, PTSD) and gender, EA was not significantly associated with loneliness. Further, results showed that the significant association between pre- and postloneliness scores was not based on condition (intervention versus control). Overall, the self-compassion intervention did not have a significant effect on loneliness compared to the control exercise. Additionally, results showed that the significant association between pre- and postintervention EA was not based on condition. Therefore, the change between pre- and post-loneliness and EA scores may not be related to the type of intervention that was implemented. Lastly, EA change (from pre- to postintervention) did not mediate the association between condition and loneliness. Factors contributing to null findings and study implications are discussed.

NORTHERN ILLINOIS UNIVERSITY
DEKALB, ILLINOIS

AUGUST 2023

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AFTER IMPLEMENTATION OF A SELF-COMPASSION INTERVENTION

BY
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A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE
DOCTOR OF PHILOSOPHY

DEPARTMENT OF PSYCHOLOGY

Doctoral Director:
Michelle M. Lilly

ADKNOWLEDGMENTS

Thank you first to my thoughtful and caring parents and sister: you all kept telling me my worth and never allowed me to doubt my abilities. Then, to my love, Kyle: thank you for your patience when I couldn't see past the stress of this document and also for supplying me with all the motivation imagined. I also have to say thank you to my friends, Diana and Jackie, who were willing to listen to all my successes and struggles and give me advice: you two are my foundation in this program. I love you all! I DID IT!

DEDICATION

To everyone who provided endless support and encouragement

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CHAPTER 1

INTRODUCTION

Loneliness has been conceptualized as the internal distress that results from the discrepancy between perceived and desired social relationship quality (Russell et al., 1980). Loneliness may be beneficial in the short term, often acting as a motivator to improve social relations (Hawkey & Cacioppo, 2010). However, chronic loneliness is associated with physical (e.g., cardiovascular disease, sleep difficulties, unhealthy habits; Cacioppo et al., 2009; Hawkey et al., 2010; Masi et al., 2011; Rubinstein et al., 1979) and psychological (e.g., depression, anxiety, suicide; Cacioppo et al., 2000; Heinrich & Gullone, 2006) consequences. Loneliness and its consequences are observable across the lifespan, increasing the importance of identifying risk factors for chronic loneliness and establishing effective interventions.

One mechanism by which loneliness may be maintained is maladaptive coping (Clark et al., 2015; Shi et al., 2016). One maladaptive coping strategy is experiential avoidance (EA), an unwillingness to experience current distress that leads an individual to ignore, deny, or suppress their emotions (Shi et al., 2016). Literature supports a significant association between EA and loneliness (Shi et al., 2016). The recommended interventions for EA incorporate a focus on approach behaviors and acceptance through mindfulness, thereby decreasing avoidance of distress (Chawla & Ostafin, 2007). A meta-analysis examining the effectiveness of mindfulness interventions on loneliness determined that the most effective treatment incorporated cognitively-based compassion training therapy (Teoh et al., 2021). However, there is a gap in the

literature examining the effect of a brief self-guided self-compassion intervention on the relationship between EA and loneliness. The current study addressed this gap by implementing a self-compassion mindfulness exercise for three days to further understand the associations between self-compassion, EA, and loneliness.

Loneliness occurs when there is a discrepancy between desired and perceived social relationship quality (Masi et al., 2011; Russell et al., 1980). Shovestul et al. (2020) stated that in a population-based study in the United Kingdom, 45% of participants report some level of loneliness. From the United States Census, approximately 28% of individuals reported living alone, a risk factor associated with higher levels of loneliness (Shovestul et al., 2020). Loneliness can serve as a motivator to seek additional support, find different social relationships, or engage in effective coping strategies (Hawkey & Cacioppo, 2010; Masi et al., 2011). People may benefit from these motivations in the short term. However, loneliness leads to impairment when it is experienced chronically (Cacioppo et al., 2006a; Cacioppo et al., 2009; Masi et al., 2011).

The majority of loneliness literature focuses on chronic loneliness, which is associated with negative outcomes (Heine et al., 2006; Tam & Chanc, 2019). State loneliness is the extent to which an individual feels lonely in the moment, as compared to trait loneliness, which is the overall lack of meaning in relationships that is chronic (Bondevik & Skogstad, 2000; Du et al., 2018; Heine et al., 2006; Hicks & King, 2009; Stillman et al., 2009). There is a reciprocal relationship between trait and state loneliness, such that trait loneliness is a predictor of state loneliness in social contexts. Van Roekel et al. (2018) determined that highly lonely adolescents (i.e., higher trait loneliness) reported higher levels of state loneliness in situations where they were alone compared to low lonely adolescents (i.e., lower levels of trait loneliness).

Additionally, state loneliness is associated with increased risk for prolonged loneliness (i.e., trait

loneliness; Tam & Chanc, 2019). Given that state loneliness is a predictor of trait loneliness, finding ways to reduce state levels of loneliness is an important step in reducing risk for trait loneliness.

CHAPTER 2

LITERATURE REVIEW

Loneliness, Vulnerability, and Social Psychological Processes

Cacioppo et al. (2009) examined how loneliness may be attributed to three social psychological processes and proposed the following three hypotheses: induction hypothesis, homophily hypothesis, and shared environment hypothesis. The induction hypothesis proposes that loneliness for one individual contributes to loneliness in others; in other words, loneliness is contagious. The homophily hypothesis theorizes that like attracts like, such that lonely individuals choose other lonely individuals with whom to connect. Lastly, the shared environment hypothesis states that individuals engage and experience activities that further contribute to loneliness, such as living in unsafe neighborhoods, which may limit residents from interacting and feeling connected (Cacioppo et al., 2009).

Cacioppo et al. (2009) conducted a research study that examined these social psychological processes and the longitudinal effects of loneliness across four separate, but related, cohorts: original cohort, their offspring and spouses, their grandchildren, and an additional “omni” cohort to expand diversity of the sample. Results concluded that family relationships did not influence loneliness ratings, whereas friend groups did influence loneliness ratings. This finding suggests that perceived rejection from chosen social networks (e.g., friends) has a greater impact on loneliness ratings compared to perceived rejection from inherited groups (e.g., family; Cacioppo et al., 2009). Individuals with more friends are ultimately projected to

experience less loneliness. Each extra friend reduced the frequency of loneliness by 0.04 days per week, totaling 2 extra days of reduced loneliness per year.

Results supported the induction hypothesis in that loneliness was contagious and shaped social networks by predicting lonely individuals to have fewer friends in the future. The homophily hypothesis was observed by the finding that lonely individuals reported higher levels of isolation and disconnectedness from others. This also supports the shared environment hypothesis by concluding that the relationships that are physically close to the lonely individual impact the individual's loneliness more than those that are distant (Cacioppo et al., 2009). These findings emphasized the importance of examining the role of social connectedness and interaction quality in predicting loneliness. Within the Cacioppo et al. (2009) study, short-term loneliness motivated individuals to seek additional friendships. Relationships that directly impact one another, or social connectedness, influences loneliness. Reported social disconnectedness with friends who live nearby increased the number of days that an individual was lonely by 0.11 days.

Loneliness and Self-Regulation

Hawkey et al. (2007) found that individuals who are more socially connected report higher levels of positive affect, such as joy and interest, perceived positive interaction quality, and positive perceptions of social experiences. Alternatively, loneliness is associated with decreased positive affect and increased negative affect, such as sadness and shame, as well as increased perceived negative interaction quality. Interaction quality also has lasting effects such that positive interaction quality is associated with increased positive affect and decreased negative affect for approximately 90 minutes. However, negative interaction quality influences

one's affect (i.e., increased negative and decreased positive affect) for up to three hours, indicating that the effects of negative perceptions provide longer lasting effects than do positive (Hawkley et al., 2007). These findings further highlight how social isolation may be associated with loneliness but represents a separate construct.

In addition, loneliness impacts one's perception of, and engagement in, social interactions. For instance, increased loneliness predicts a decrease in engaging in health-promoting practices, such as increased social interaction (Hawkley et al., 2009; Hawkley et al., 2010). This decrease in health-promoting practices may be the result of impaired self-regulation, which impacts one's ability to change their cognitions, emotions, and behaviors to reach personal goals and social standards. As previously mentioned, loneliness experienced in the short term may be beneficial, acting as a motivator to self-regulate by seeking support or completing health-promoting practices such as eating healthier and being active. However, for those that report chronic loneliness, the effects are noticeable behaviorally, cognitively, and emotionally.

Behaviorally, those that are lonely are less likely to engage in physical activity and more likely to engage in unhealthy actions such as eating unhealthy foods and consuming alcohol or other drugs (Heinrich & Gullone, 2006). Loneliness has also been associated with physical health problems such as elevated systolic blood pressure, increased hypothalamic pituitary adrenocortical (HPA) activity, cardiovascular disease, and abnormal ratios of circulating white blood cells (Cacioppo et al., 2009; Cacioppo et al., 2000; Cacioppo et al., 2002; Hawkley et al., 2010; Masi et al., 2011). These physical health problems have been associated with a higher level of sleep difficulties (Hawkley et al., 2010), daytime functioning (e.g., exhaustion, fatigue, low energy), and aggression (Hawkley & Cacioppo, 2010). Not only does loneliness influence the amount of exercise and healthy habits with which one engages, but it also influences

subjective physical health. Specifically, individuals that report higher levels of loneliness perceive themselves as less attractive and in poorer health condition (Tsur et al., 2019).

In the cognitive domain, the loneliness model proposed by Hawkley and Cacioppo (2010) specified that perceived social relationship deficiency or rejection (i.e., loneliness) produces cognitive biases. These cognitive biases lead lonely individuals to feel unsafe, perceiving and evaluating oneself and their social network negatively (Cacioppo & Hawley, 2009; Hawkley & Cacioppo, 2010; Heinrich & Gullone, 2006; Larose et al., 2002; Newall et al., 2009). The biases may become a self-fulfilling prophecy in which lonely individuals physically distance themselves from others, increase isolation, and attribute the cause of the isolation as out of their control (Hawkley & Cacioppo, 2010; Newall et al., 2009).

Additionally, chronic loneliness is associated with cognitive deficits, such as impaired inhibition and attentional control, impacting how one perceives social interactions and responds to stressful stimuli (Cacioppo & Hawkley, 2009). These impairments are observed in cognitive tasks, such as attentional control (Baumeister et al., 2005; Cacioppo et al., 2000; Cacioppo & Hawkley, 2009; Hawkley et al., 2010). Lonely individuals demonstrate impairments in attentional control by having a longer response time to a novel or competing stimulus. They also make more mistakes on logical reasoning tasks (Baumeister et al., 2005; Cacioppo et al., 2000; Cacioppo & Hawkley, 2009; Hawkley et al., 2010). Cacioppo and Hawkley (2009) reported that higher levels of loneliness are associated with changes in IQ and cognitive decline, specifically for higher order cognitive tasks and self-regulatory processes. Further, Sin et al. (2021) found that loneliness is significantly related to diminished executive control, specifically planning and working memory. However, the strongest predictor of loneliness scores was depressive ratings,

highlighting the importance of understanding how loneliness is associated with emotional constructs.

In the domain of emotional responding, Rubinstein et al. (1979) identified four ways in which loneliness is experienced emotionally. These four categories include: desperation (i.e., feeling panicked, hopeless, and abandoned), depression (i.e., feeling empty, sorry for self, melancholy), impatient boredom (i.e., difficulty concentrating, desire to be elsewhere, and feeling angry), and self-deprecation (i.e., feeling unattractive, ashamed, and insecure; Rubinstein et al., 1979). These categories demonstrate the heterogeneity of loneliness and its negative impact on a lonely individual's emotional state. This loneliness heterogeneity influenced research to further explore the relationship between loneliness and other emotional constructs. As such, the research literature has expanded to examine associations between loneliness and other psychological constructs such as low self-esteem, shyness, suicide, personality disorders, psychotic symptoms, and stress (Cacioppo et al., 2000; Cheek & Busch, 1981; Heinrich & Gullone, 2006; Jackson & Cochran, 1991; Jones et al., 1981).

Findings reveal that chronic loneliness is often associated with intense negative emotions (Heinrich & Gullone, 2006; Rubinstein et al., 1979). Negative emotions experienced chronically influence an individual's worldview and beliefs, as well as promote unhealthy behaviors (Hawkley & Cacioppo, 2010; Heinrich & Gullone, 2006; Tsur et al., 2019). The interaction between negative emotions, changed perspectives, and interfering behaviors is associated with impairing mental health conditions, such as depression, anxiety, and posttraumatic stress disorder (PTSD; Cacioppo et al., 2009; Cacioppo et al., 2006b; Lasgaard et al., 2010; Maes et al., 2019b; Muyan et al., 2016; Palgi et al., 2012; van der Velden et al., 2018). Beyond understanding the

behavioral, cognitive, and emotional influences of loneliness, it is important to next distinguish between risk factors and psychopathological consequences of loneliness.

Risk Factors for Loneliness

Maes et al. (2019b) examined risk factors for loneliness and demonstrated that loneliness levels may differ based on the loneliness measure implemented (e.g., single-item, revised UCLA Loneliness Scale [R-UCLA-LS]), and may also differ based on an individual's gender, age, and ethnicity (Hawkey et al., 2005). Borys and Perlman (1985) highlighted how the measure used to assess loneliness may impact the observed gender differences. For instance, the R-UCLA-LS is typically associated with no gender effects. Yet, males report greater levels of loneliness on multiple item questionnaires. Comparatively, on single-item measures that self-label loneliness, women report loneliness more frequently. Therefore, males may endorse more symptoms of loneliness, while females may be more likely to self-label their distress as loneliness (Borys & Perlman, 1985; Maes et al. 2019b).

Literature remains conflicted regarding whether gender is a risk factor for loneliness, as findings have differed as a function of one's age. In adolescence, females may report higher levels of loneliness compared to males due to its categorization as an internalized problem of which females are at heightened risk (Maes et al., 2019b). Within elderly populations, it has been reported that women may be lonelier because statistically they live longer and therefore are more likely to be widowed, experience functional limitations, and require more medical care (Pinquart & Sorensen, 2001). Other literature highlights how men's social networks are smaller than women's in old age, making their experience of becoming widowed or divorced more negatively impactful (Cooney & Dunne, 2001). Overall, a meta-analysis on loneliness that considered

results from 575 studies assessing for gender differences in loneliness indicated that men are slightly lonelier than females ($g = 0.08$; $SE = 0.03$, 95% CI: 0.02, 0.13, $p = .005$; Maes et al., 2019b). The largest gender difference in loneliness ratings was observed for young adults, indicating that age may be a moderating factor (Maes et al., 2019b).

Literature often focuses on the role of loneliness in elderly populations because as one ages the possibility of experiencing loss of relationships increases, contributing to higher levels of loneliness (Pinquart & Sorensen, 2001). Shovestul et al. (2020) reported that loneliness ratings increase steeply beginning at age 10, peaking at age 18.6. After entering adulthood, loneliness ratings tend to decrease until the elderly years, beginning at 70 years old. However, other research suggests that loneliness is prevalent and stable across the lifespan (Boomsma et al., 2005, Maes et al., 2019b; Masi et al., 2011; Shovestul et al., 2020). Results from a meta-analysis supported that loneliness was present across the lifespan – children younger than 12 to elderly over 65 years old (Maes et al., 2019b). While some studies suggest that the strongest predictor of loneliness was old age, the meta-analysis found significant effects of loneliness for children ($\beta = 0.08$; 95% CI: 0.01, 0.14, $p = .027$), adolescents ($\beta = 0.08$; 95% CI: 0.03, 0.13, $p = .002$), and young adults ($\beta = 0.12$; 95% CI: 0.06, 0.18, $p < .001$; Maes et al., 2019b).

As previously mentioned, chronic loneliness is also associated with higher levels of negative affect (Masi et al., 2011; Hawkley et al., 2010). Relatedly, literature supports that negative affect, as well as loneliness vulnerability, increases if an individual engages in unhelpful practices such as self-judgment, isolation, and over-identification (Muris & Petrocchi, 2017). Engagement in these unhelpful practices is positively associated with an expectation for, and readiness to respond to, social rejection, both of which are associated with increased loneliness (Borawski & Nowak, 2022). When experienced long-term, perceived unsupportive

relationships, negative affect, and loneliness contributes to psychological disorders, such as anxiety, depression, and PTSD (Cacioppo et al., 2009; Cacioppo et al., 2006b; Chang, 2018; Hawley & Cacioppo, 2010; Lasgaard et al., 2010; Maes et al., 2019b; Muyan et al., 2016; Palgi et al., 2012; van der Velden et al., 2018). These significant associations highlight the importance of understanding the associations between loneliness and psychological disorders.

Psychopathology and Loneliness

Humans are social beings, meaning that they have an innate need to belong, which becomes a motivation toward interpersonal behavior (Hawley et al., 2007; Heinrich & Gullone, 2006). Those who are able to form intimate and positive connections with others may have resulting positive thoughts and emotions. On the other hand, for those that are unable to form positive connections, negative thoughts and emotions may result. As previously mentioned, the loneliness model highlights how loneliness stems from perceived social rejection and deficient social relationships (Hawley & Cacioppo, 2010). Through the self-fulfilling prophecy, lonely individuals may perceive the social world as threatening, expect more negative social interactions, and behave in a way that is against social standards (e.g., isolate themselves). These outcomes elicit negative reactions from others that then enhances risk for psychological distress, such as depression, anxiety, and PTSD (Cacioppo & Hawley, 2009; Hawley & Cacioppo, 2010; Layden et al., 2018; Wheeler et al., 1983).

Loneliness and Depressive Symptoms

Weeks et al. (1980) examined the longitudinal relationship between depression and loneliness in 333 undergraduate students. Measurements were taken at two time points over a 5-

week period. Loneliness was measured with the R-UCLA-LS. Depression was measured with the Beck Depression Inventory (BDI) and had good reliability ($\alpha = .86$). The depression subscale of the Profile of Mood States survey was included to assess for overlap between loneliness and depression. The measure included 15 mood adjectives (e.g., sad, gloomy) rated on a 5-point scale; the measure indicated strong reliability ($\alpha = .95$). Results showed that loneliness and depression were correlated but distinct constructs, as demonstrated by the correlations between the two variables across the two time points ($r = .701$ for time one and $r = .613$ for time two). Additionally, Weeks et al. (1980) completed a structural equation model to further examine the relationship between depression and loneliness. The significant results indicated that the data are best described as two separate factors (i.e., depression and loneliness; $\chi^2 = 527.9580$, $p < .0005$). Both constructs remained distinct and demonstrated temporal stability across the 5-week period based off of the large magnitude of the same-factor paths (Weeks et al., 1980).

The association between loneliness and depressive symptoms has been observed across the lifespan (Alpass & Neville, 2003; Cacioppo et al., 2009; Cacioppo et al., 2006b; Jackson & Cochran, 1991; Lasgaard et al., 2010; Liu et al., 2014; Ouelett & Joshi, 1986; Weeks et al., 1980). Lasgaard et al. (2010) examined the relationship between loneliness and depression in two waves one year apart. Results concluded that depressive symptoms led to increased loneliness, but loneliness did not predict higher levels of depressive symptoms (Lasgaard et al., 2010). Therefore, in this study, depression may be a risk factor for loneliness, but loneliness may not be a risk factor for depression (Lasgaard et al., 2010).

Conversely, Cacioppo et al. (2010) reported the opposite relationship between loneliness and depression. Their study examined the relationship between loneliness and depressive symptoms in 229 individuals aged 5-68 years across 5 years. Loneliness was measured using the

R-UCLA-LS (i.e., 20 items rated on a 4-point scale from 1 [never] to 4 [often]) with excellent reliability (mean $\alpha = .91$, range .90-.92 across 5 years). Depression was measured with the Center for Epidemiological Studies Depression Scale (CES-D; 20-items rated on a 4-point scale from 0 [rarely or none of the time] to 3 [most or all of the time]) with good reliability (mean $\alpha = .89$, range .88-.89 across 5 years). Cross-lag analyses indicated that loneliness predicted changes in depressive symptomatology over time ($\beta = 0.79$, 95% CI: 0.66, 0.92, $p < .01$), but depressive symptomatology did not predict changes in loneliness ($\beta = 0.10$, 95% CI: -0.05, 0.20, n.s.).

Within a sample of 212 adults aged 50-67 across three years, Cacioppo et al. (2006b) demonstrated a reciprocal relationship between loneliness and depressive symptoms across time. Loneliness was measured with the R-UCLA-LS (i.e., 20 items rated on a 4-point scale from 1 [never] to 4 [often]) with excellent reliability ($\alpha = .91$). Depressive symptoms were measured with the CES-D (20-items rated on a 4-point scale from 0 [rarely or none of the time] to 3 [most or all of the time]; reliability was not reported). One item asking whether the individual felt lonely was excluded to minimize overlap with loneliness symptoms. Results from a latent variable growth model supported that after controlling for demographic variables, loneliness measured at year one predicted depressive symptoms at year three ($\alpha = 1.40$, $p < .05$) and depressive symptoms at year one predicted loneliness at year three ($\alpha = 1.56$, $p < .05$). In conclusion, the study found that both loneliness and depressive symptoms significantly predicted each other (Cacioppo et al., 2006b). These conflicting findings (i.e., Cacioppo et al., 2009; Cacioppo et al., 2006b; Lasgaard et al., 2010) indicate that while the directional relationship between loneliness and depression is unclear, literature consistently supports a significant association. The following studies provide further evidence to support the relationship between depressive symptoms and loneliness.

Loneliness and Anxiety Symptoms

Varying presentations of anxiety are related to loneliness. Maes et al. (2019a) conducted a meta-analysis examining the relationship between loneliness and social anxiety symptoms across childhood and adolescence. All cross-sectional correlations between social anxiety symptoms and loneliness were positive ($r_s = .10-.72$), except for one correlation ($r = -.75$; the authors did not specify which correlation). The mean effect size of the relationship between loneliness and social anxiety symptoms was $\beta = 0.46$ (95% CI: 0.43, 0.48, $p < .001$). Longitudinal analyses demonstrated that loneliness was stable across time ($\beta = 0.07$, 95% CI: 0.38, 0.68, $p < .001$). Cross-lagged analyses indicated a reciprocal relationship between loneliness and social anxiety across time ($\beta = 0.04$, 95% CI: 0.04, 0.15, $p < .011$ for the effect of loneliness on social anxiety symptoms; $\beta = 0.03$, 95% CI: 0.03, 0.15, $p = .009$ for the effect of social anxiety symptoms on loneliness). The conclusion from the meta-analysis indicated that loneliness and social anxiety symptoms are positively associated and stable across childhood and adolescence (Maes et al., 2019a).

Examining the role of negative affective conditions (e.g., anxious and depressive symptoms) and loneliness, Chang (2018) assessed 168 African American college students. Results revealed that negative affective conditions of interest were largely interconnected such that that loneliness will be related to both anxiety and depressive symptoms. Loneliness was measured with the R-UCLA-LS. Anxious symptoms were measured with the 21-item Beck Anxiety Inventory (BAI) and depressive symptoms were assessed by the BDI; Cronbach's alphas were not reported. When categorized by gender, the relationship between loneliness and anxiety symptoms was significant for women ($\beta = 0.36$, $t = 11.12$, $p < .001$), but not for men ($\beta = 0.04$, t

= 0.62, $p > .05$). Loneliness was significantly associated with depressive symptoms for women ($\beta = 0.34$, $t = 11.12$, $p < .001$) and men ($\beta = 0.15$, $t = 2.55$, $p < .05$), though the relationship was stronger for women. Conclusions indicated that the relationship between anxiety, loneliness, and depression is observed across the lifespan of the African American college student sample (Chang, 2018).

Loneliness and PTSD Symptoms

The loneliness model argues that through the perception of negative social experiences, an individual's thoughts, emotions, and behaviors change (Hawkey & Cacioppo, 2010). This model is similar to the "just world theory" in which following a traumatic event, one's belief that the world is a just and good place is shattered, resulting in PTSD symptom distress, which may provide reason to further investigate this relationship between loneliness and PTSD (Janoff-Bulman, 1989).

Examining the relationships between loneliness, social support, and both chronic and acute reactions to combat stress, Solomon et al. (2015) assessed a sample of male Israeli war veterans from the 1982 Lebanon War. Participants were assessed at three time points: 2 years (1984; T1), 3 years (1985; T2), and 20 years (2002; T3) after the war; total participants included 346 veterans with combat stress reaction (CSR) and 264 veterans without CSR. PTSD symptoms (i.e., intrusive and avoidance symptom clusters) were assessed by the 15-item Impact of Event Scale survey (IES; Horowitz et al., 1979; rated on a 4-point scale from 1 [not at all] to 4 [very often]). The measure indicated good reliability for avoidance ($\alpha = .82-.89$) and good to great reliability for intrusion ($\alpha = .85-.95$) across the three time points. Loneliness was measured by the average of the item responses from the R-UCLA-LS ($\alpha = .93$). Perceived social support was

assessed by the Social Network Interview for which participants answered seven items regarding expressive and instrumental support from those in their network. Items were rated on a 4-point scale ranging from 1 (not at all) to 4 (very much); the measure demonstrated good reliability ($\alpha = .86$). Results indicated that veterans with CSR demonstrated consistent loneliness across time ($\beta = -0.01, t = -0.39, p = .70$; loneliness at T1 = 36.85, T2 = 36.15, T3 = 36.73). Regarding veterans without CSR, loneliness ratings significantly decreased by 0.05 annually ($t = -2.05, p < .05$) as evidenced by a score of 30.69 at T1, 30.05 at T2, and 29.80 at T3. However, analyses indicated that veterans with CSR compared to those without CSR did not differ in the rate of change in loneliness ratings across time ($\chi^2 = 0.45, p = .50$). Longitudinally, for veterans with CSR, IES scores (i.e., PTSD symptoms) were positively associated with loneliness scores across all time points ($b = 2.85, \beta = 0.35, t = 4.91, p < .001$ at T1; $b = 2.65, \beta = 0.29, t = 4.64, p < .001$ at T2; $b = 3.89, \beta = 0.37, t = 7.91, p < .001$ at T3). Higher IES scores for veterans with no CSR were positively associated with loneliness scores only for T1 ($b = 2.75, \beta = 0.22, t = 3.26, p < .01$ at T1; $b = 1.56, \beta = 0.11, t = 1.44, p = .15$ at T2; $b = 1.71, \beta = 0.12, t = 1.73, p = .09$ at T3).

Results from Solomon et al. (2015) suggest that PTSS may not predict long-term loneliness. This finding may be due to variability in PTSS scores across time. Another limitation of the Solomon et al. (2015) study was a failure to control for resilience or change in scores within analyses, as well as utilizing a PTSD measure that does not assess for all PTSD symptom clusters (e.g., negative alternations in cognitions and mood). Future studies should assess whether PTSD symptom clusters are differentially related to loneliness. The prevalence of loneliness worldwide and its impairing consequences highlight the importance of assessing for contributing factors, such as PTSD (Janoff-Bulman, 1989; Kuwert et al., 2014; Palgi et al., 2012; Solomon et al., 2015; van der Velden et al., 2018).

Experiential Avoidance

Experiential avoidance (EA) is one factor that may be implicated in the relationship between psychopathology and loneliness. Humans want to avoid negative affect (Hayes et al., 1996). EA is defined as an unwillingness to remain in discomfort and taking action in order to escape or change the distressing experience (Hayes et al., 1996). Previous literature has revealed that engagement in EA is associated with psychological distress and emotional numbing, which may be possible explanations for how loneliness may be associated with psychopathology (Brockman et al., 2016; Hayes et al., 1996; Tull & Roemer, 2003).

Experiential Avoidance and Loneliness

The Reinforcement Sensitivity Theory (RST) may be one explanation to understanding loneliness and its long-term consequences (Clark et al., 2015). Two motivation systems have been identified to underlie this theory: the Behavioral Activation System (BAS) and Behavioral Inhibition System (BIS). The BAS is associated with rewards and approach behaviors while the BIS is associated with punishment and avoidant behaviors. Loneliness is typically associated with activation of the BIS system (Chang et al., 2014). Additional research splits the BIS system into two components: fear and anxiety. The distinction between these components is that the fear component is associated with absence of the BAS system while the anxiety component is a conflict between the presence of both the BIS and BAS systems (Clark et al., 2015). Within a sample of lonely individuals, Clark et al. (2015) examined the role of BAS and BIS with the 30-item Jackson-5 survey (items rated on a 5-point scale from 1 [completely disagree] to 5 [completely agree]; no Cronbach's alpha provided; Jackson, 2009). Specifically, Clark et al. (2015) investigated whether lonely individuals would be more likely to engage in the fear

component compared to the anxiety component of BIS and less likely to engage in BAS. Results from an online sample of 380 adults from Amazon's Mechanical Turk demonstrated that lonely individuals report increased BIS related to fear ($r = .18, p < .05$). Lonely individuals did not report increased BIS related to anxiety ($r = -.02, n.s.$). The increased engagement from the fear component of BIS may indicate that lonely individuals are prone to avoidance, such as engaging in social situations. Consistent with the hypothesis, fewer lonely individuals reported increased BAS. This relationship was mediated by increased sociability, communal orientation, acceptance, and lower shyness ($ps < .01$). Overall, the study's findings may suggest that interventions targeting loneliness reductions should focus on effective emotion regulation strategies such as increasing approach behaviors and reducing avoidance (Clark et al., 2015).

Ineffective emotion regulation strategies may be one maintenance factor of loneliness (Shi et al., 2016). Within a sample of 500 undergraduate students in China, there was a significant relationship between emotion regulation abilities and loneliness ($\beta = -0.40, p < .001$). The study's findings indicate that high emotion regulation abilities, such as increased engagement in effective strategies like approach, was associated with decreased loneliness (Shi et al., 2016). Moreover, EA was a full mediator between emotion regulation abilities and loneliness. Lonely individuals that report poor emotion regulation may then engage in higher levels of EA, which increases loneliness ($\chi^2 = 437.519, p < .001, SRMR = 0.04, RMSEA = 0.04, CFI = 0.95$; Shi et al., 2016).

Additional research indicates that EA also mediates the relationship between loneliness and psychological stress (Ortega-Jimenez et al., 2021). Ortega-Jimenez et al. (2021) examined the relationship between psychological inflexibility, measured as increased EA, loneliness, and psychological stress (measured through the 14-item Perceived Stress Scale [PSS]; Ruisoto et al.,

2020) in 902 university professors in Ecuador. There was a significant indirect effect of loneliness on psychological stress after including EA as the mediator ($b = 0.2869$, $p < .001$, 95% CI: 0.2354, 0.3405; Ortega-Jimenez et al., 2021). Therefore, EA may not only impact negative internal events for lonely individuals, but also the association between loneliness and increased unhealthy behaviors.

The association between lonely individuals and increased engagement in avoidant rather than approach behaviors is consistent with lifestyle behaviors of lonely individuals. Lonely individuals report greater levels of unhealthy behavior and decreased engagement in behaviors that are healthy-related such as physical activity (Heinrich & Gullone, 2006; Losada et al., 2015). These actions may be explained by lonely individuals engaging in EA over time. Long-term engagement in EA may reduce engagement in social activities and opportunities for desirable interactions (Losada et al., 2015). However, the decreased engagement may also be influenced by changes in external factors such as physical health and the presence of psychopathology, rather than EA. Losada et al. (2015) examined the relationship between EA, physical activity, loneliness, and anxiety in a sample of 395 adults from Spain over the age of 60. Findings showed that individuals who endorsed being lonely and inactive (i.e., scoring low on the following: social support, leisure activities, and capitalizing on pleasant activities; scoring high on the following: boredom and loneliness) reported the highest scores of EA and anxiety levels and the lowest scores in physical functioning and vitality ($\chi^2 = 47.15$; $p < .01$; Losada et al., 2015). The studies support the relationship between avoidance and resulting behaviors in lonely individuals (Heinrich & Gullone, 2006; Losada et al., 2015; Ortega-Jimenez et al., 2021; Shi et al., 2016).

Experiential Avoidance and Psychopathology

Increased EA may also explain the relationship between loneliness and psychopathology. Fledderus et al. (2010) expanded the finding from Shi et al. (2016) and assessed the relationship between EA, maladaptive coping, and general psychological distress. Findings indicated that passive coping (i.e., feeling incapable of responding and avoiding reality) was related to EA ($r = -.56, p < .01$). Additionally, EA mediated the effects of passive coping on depression ($\beta = .22$), anxiety ($\beta = -.01$), emotional well-being ($\beta = -.13$), and psychological well-being ($\beta = -.23$). EA also mediated the relationship between quality of life and psychological disorders such as social anxiety disorder (SAD; bootstrap mean = 2.44, 95% CI: 0.66, 4.51, $p < .05$) and PTSD (bootstrap mean = 1.81, 95% CI: 0.61, 3.19, $p < .05$). This finding indicates that EA may be a mechanism by which negative emotions result from multiple predictors such as maladaptive coping (Fledderus et al., 2010). These findings were replicated by Spinhoven et al. (2014) who examined the mediating role of EA in emotional disorders longitudinally, concluding that EA mediated the relationship between fear disorders (i.e., social anxiety, panic, and agoraphobia disorders) and distress disorders (i.e., dysthymia, major depressive, and generalized anxiety disorders) in both directions ($\beta = .07, p < .05$ for fear disorders predicting distress disorders; $\beta = .11, p < .001$ for distress disorders predicting fear disorders). Overall, higher levels of EA may be associated with the development of psychological disorders (Fledderus et al., 2010; Spinhoven et al., 2014).

EA may influence not only how one responds to negative internal events but also how one responds in stressful, and potentially dangerous, situations. Bell and Higgins (2015) highlight that experiencing childhood physical abuse may influence one to engage in EA to cope.

The authors concluded that childhood physical abuse and EA were directly related to physical interpersonal violence victimization, providing support that EA may increase one's risk to future adverse events (Bell & Higgins, 2015). These findings indicated that EA is not only implicated in the maintenance of loneliness, but other psychological distress such as depression, anxiety, and PTSD (Bell & Higgins, 2015; Fledderus et al., 2010; Tull et al., 2004). Tull et al. (2004) also examined the relationships between EA and depression, anxiety, and PTSD in a sample of 160 women with exposure to potentially traumatic events (PTE). Results showed that EA predicts depression ($\beta = 0.26, p < .001$) and anxiety ($\beta = 0.25, p < .001$), controlling for the number of PTEs experienced. These findings suggested that EA may underlie clinical disorders that are associated with avoiding internal experiences (e.g., emotions; Hayes et al., 1996). Regarding PTSD, EA did not significantly predict PTSS above the number of PTEs ($\beta = 0.00, p > .05$). However, there was a significant association between thought suppression and PTSS ($\beta = 0.14, p < .01$), suggesting that individuals reporting PTSS may be maintaining the distress with one form of EA (i.e., thought suppression).

Chawla and Ostafin (2007) reviewed the relationship between EA and psychopathology and determined that avoidance may influence future cognition and behavior. The avoidance may be helpful in the short term but is associated with psychopathology in the long-term (Chawla & Ostafin, 2007). The review provides evidence for the relationship between EA and a variety of psychological disorders (e.g., depression, anxiety, PTSD).

Experiential Avoidance Interventions

Interventions to address EA have also been shown to improve psychological disorders. Chawla and Ostafin (2007) covered two interventions focusing on EA to reduce psychological

distress: Acceptance and Commitment Therapy (ACT) and Mindfulness. ACT targets difficulties from changeable domains (e.g., overt behavior) and emphasizes prioritizing actions that move towards one's life values. Mindfulness emphasizes exercising attentional control on the present, which counters avoidance. Eifert et al. (2009) further explained both interventions. ACT decreases EA and increases acceptance and approach behaviors, which is associated with an increased willingness to confront difficult situations and exposures that are associated with psychopathology (e.g., anxiety, panic disorder; Chawla & Ostafin, 2007, Zettle, 2003). Mindfulness interventions are also effective psychopathology treatments for depression, anxiety, and PTSD.

A common method to assess for the effectiveness of EA interventions is a carbon dioxide challenge in which participants receive CO₂-enriched air for a period of time (e.g., 5.5% CO₂-enriched air for 15 minutes; Levitt et al., 2004). Then their ability to complete tasks, subjective levels of physiological and psychological distress, and willingness to complete a subsequent challenge are measured (Levitt et al., 2004). There are typically two comparison groups for the challenge who receive different instructions about how to respond during the task: acceptance or avoidance. Eifert and Heffner (2003) reported that individuals with anxiety completed tasks slower in the avoidance group compared to those in the acceptance group. Additionally, Levitt et al. (2004) concluded that those in an acceptance group report decreased subjective anxiety and increased willingness to complete the challenge again. Other research studies report significant physiological differences between individuals reporting high versus low EA (Sloan et al., 2004; Zettle et al., 2003). Research supports differing physiological and emotional responses to pleasant, unpleasant, and neutral stimuli dependent on EA levels (Sloan et al., 2004). The majority of studies conclude that EA is associated with the perception of physical or emotional

discomfort rather than the actual occurrence of bodily sensations. In other words, these studies determined that there are no significant differences in physiological changes such as increased heart rate or skin conductance between high and low EA (Chawla & Ostafin, 2007; Eifert & Heffner, 2003; Levitt et al., 2004; Spira et al., 2004; Zettle et al., 2003). Similarly, the negative consequences of loneliness are based on the perception of social disconnectedness rather than the actual occurrence of being alone. Therefore, the effectiveness of interventions for EA focusing on approach behaviors (e.g., mindfulness) may also be similar for addressing loneliness.

Previous literature indicates positive relationships between loneliness and depression, anxiety, and PTSD. Research also supports relationships between EA and loneliness and EA and psychopathology (i.e., depression, anxiety, and PTSD). The effectiveness of EA interventions (e.g., ACT and mindfulness) are observed across loneliness, depression, anxiety, and PTSD symptom severity (Chawla & Ostafin, 2007; Eifert & Heffner, 2003; Levitt et al., 2004; Spira et al., 2004; Zettle et al., 2003). However, there is limited research examining the effectiveness of interventions for loneliness while controlling for symptoms of psychopathology (e.g., depressive, anxiety, and PTSD symptoms).

Mindfulness

Mindfulness has been characterized as the state of mind that one develops by being aware of and accepting present-moment thoughts and feelings (e.g., emotional, physiological). This state of mind incorporates awareness of the person's inner and outer experiences and approaching these thoughts and feelings from a flexible, non-judgmental, and present-oriented focus (Brown et al., 2007; Jin et al., 2020; Kabat-Zinn, 2003). A common finding regarding risk for chronic loneliness and its impairing consequences is the consistent use of unhelpful coping

strategies. These coping strategies include avoiding and perceiving social interactions in a negative and judgmental way. Jin et al. (2020) investigated the association between trait mindfulness and loneliness in a sample of 566 college students in China. Findings confirmed that trait mindfulness significantly and negatively predicted loneliness for both men ($\beta = 0.389, p < .001$) and women ($\beta = 0.018, p < .001$). Therefore, mindfulness interventions may be an ideal approach to increasing trait mindfulness and decreasing loneliness.

Mindfulness Interventions and Loneliness

Teoh et al. (2021) completed a meta-analysis of studies that examined the role of loneliness after implementation of mindfulness interventions. A total of eight studies were included in the analyses with samples from the United States, India, and Korea. The mindfulness interventions were most commonly eight weeks long and included the following: mindfulness-based stress reduction (Creswell et al., 2012; Jazaieri et al., 2012), cognitively based compassion training (Dodds et al., 2015; Mascaro et al., 2018), mindfulness based cognitive therapy (Zhang et al., 2018), brain education-based meditation (Lee et al., 2019), mindfulness meditation focused around acceptance (Lindsay et al., 2019), and yoga (Pandya, 2019). Results indicated that half of the studies reported significant loneliness reductions after the mindfulness intervention. In a sample with no mental health conditions, the most effective intervention was the cognitively-based compassion training (Mean Difference: -6.05; 95% CI: -9.35, 2.58, $I^2 = 0.0\%$, $p = .424$; Dodds et al., 2015). Overall, cognitively-based compassion training provided the largest effect with a standardized mean difference of -0.85 (95% CI: -1.36, -0.35, $I^2 = 0.0\%$, $p = .751$; Dodds et al., 2015; Mascaro et al., 2018; Teoh et al., 2021).

Considering the findings from the meta-analysis, the current study incorporated three recommendations made by Teoh et al. (2021). The first recommendation was to compare mindfulness with an active control group; the current study included a control group which completed a progressive muscle Relaxation (PMR) activity. The second recommendation was to consider participants' characteristics; the current study controlled for mental health difficulties associated with loneliness and avoidance (i.e., anxiety, depression, PTSD). The final recommendation by Teoh et al. (2021) was to implement a different mode of mindfulness; the current study implemented a mindfulness intervention online. Of note, particularly within a younger sample, a self-guided exercise completed online was the preferred method to practice mindfulness as reported by Wahbeh et al. (2014). The current study sample includes undergraduate college students and are therefore largely young adults. Utilizing this preferred method may increase buy-in and decrease dropout in the current study. As the largest effect of loneliness reduction was a compassion therapy, a mindfulness-based intervention focused on self-compassion may be most beneficial for those who report high levels of loneliness.

Self-Compassion and Loneliness

Self-compassion has three components and is identified as being kind, gentle, and accepting of oneself (Gilbert, 2009; Neff, 2003). Each of the three components include two dimensions. The first component is self-kindness versus self-judgment, highlighting that self-compassion is when one is kind and understanding towards themselves. The second component, sense of common humanity versus isolation, emphasizes that all humans make mistakes and therefore self-compassion encourages people to accept that being imperfect is a human, rather than an isolating, experience. The realization that being imperfect is a shared experience

encourages self-compassionate individuals to take a gentle approach towards themselves. The third and final component is mindfulness versus over-identification, indicating that those who are self-compassionate will accept themselves and difficulties in the present-moment non-judgmentally.

Akin (2010) examined the relationship between each component of self-compassion and loneliness within a sample of 298 university students from Turkey. Loneliness predicted the six dimensions of self-compassion with an excellent fit ($\chi^2 = 2.38$, GFI = 0.98, AGFI = 0.96, CFI = 0.99, RFI = 0.99, IFI = 0.99, RMSEA = 0.038) accounting for 76% of variance in loneliness. Specifically, loneliness was negatively predicted by self-kindness ($\beta = -0.31$), common humanity ($\beta = -0.20$), and mindfulness ($\beta = -0.25$) and positively predicted by self-judgment ($\beta = 0.39$), isolation ($\beta = 0.41$), and over-identification ($\beta = 0.36$; Akins, 2010). Literature consistently supported a relationship between self-compassion and loneliness such that increased self-compassion is associated with decreased loneliness ratings, possibly identifying it as a protective factor of loneliness (Akin, 2010; Farzanfar et al., 2020; Kotera et al., 2021; Liu et al., 2020; Moghadam et al., 2021; Teoh et al., 2021).

The current study examined the relationship between loneliness, EA, and self-compassion mindfulness. Loneliness is defined as distress when an individual recognizes a discrepancy between what is desired and perceived in a social relationship. The reaction to experiencing state (i.e., momentary) loneliness may be to engage in helpful strategies, such as increasing social interactions, or unhelpful strategies, such as engaging in EA (i.e., unwillingness to experience pain; Haynes et al., 1996).

Clark et al. (2015) concluded that lonely individuals report increased engagement from the fear component of BIS and are prone to avoidance. This study's findings, as well as

additional research reporting a positive association between avoidance and increased loneliness, may suggest that interventions targeting loneliness reductions should focus on effective emotion regulation strategies such as increasing approach behaviors and reducing avoidance (Bell & Higgins, 2015; Clark et al., 2015; Kashdan et al., 2009; Ortega-Jimenez et al., 2021; Shi et al., 2016). When an individual increasingly copes with loneliness with EA, they are at an increased risk to experiencing chronic loneliness, which is associated with additional negative outcomes (Ortega-Jimenez et al., 2021). Therefore, focusing on an intervention to improve momentary (e.g., state) loneliness may reduce the likelihood of one experiencing chronic loneliness and the resulting negative outcomes.

An effective strategy for reducing EA as a coping strategy is mindfulness (Teoh et al., 2021). A meta-analysis of mindfulness-based interventions revealed that mindfulness is an effective way to reduce loneliness (Teoh et al., 2021). Further, the mindfulness intervention that was most effective in reducing loneliness was compassion based. These interventions focused on training lonely individuals to feel and act more compassionately toward themselves and others. The protocol includes developing meditative concentration and mindfulness, examining the causes of suffering (e.g., cognitive contributions), practicing self-compassion and gratitude (for social interconnection), understanding the concept of common suffering, and deepening the aspirational wish for all human beings be happy and free from suffering (Dodds et al., 2015; Mascaro et al., 2018). While the compassion-based protocol had the largest effect on loneliness, the typical protocol last eight weeks.

The current study explored whether one component of the protocol would effectively reduce state loneliness within one week. Mascaro et al. (2018) reported that changes in compassion were most robust compared to other modules of the protocol, suggesting that

increasing self-compassion may be beneficial in reducing state loneliness. Gao et al. (2023) demonstrated that self-compassion is a protective factor against loneliness. This finding has been supported consistently in literature (Akin, 2010; Dodds et al., 2015; Farzanfar et al., 2020; Kotera et al., 2021; Liu et al., 2020; Mascaro et al., 2018; Moghadam et al., 2021; Muris & Petrocchi, 2017; Teoh et al., 2021). Alternatively, if the self-compassion components are not developed and practiced (i.e., self-judgment, isolation, and over-identification), an individual's vulnerability to chronic loneliness increases (Muris & Petrocchi, 2017). Therefore, the current study examined whether the self-compassion mindfulness intervention would reduce EA and state loneliness.

There have been two studies that implemented a cognitively-based compassion training intervention, which encompasses improving self-compassion, with lonely individuals (Dodds et al., 2015; Mascaro et al., 2018). However, there is a gap in the literature examining the effectiveness of a brief self-guided self-compassion mindfulness intervention. The current study implemented a self-compassion mindfulness intervention to examine the effect on loneliness ratings within a sample of undergraduate students. The current study also examined the effect of a self-compassion mindfulness intervention on EA. Literature supports a significant relationship between loneliness and EA (Clark et al., 2015; Losada et al., 2015; Ortega-Jimenez et al., 2021; Shi et al., 2016). The current study also examined the relationship between loneliness and EA within the implementation of a self-compassion versus an active control condition. Some studies examining the effectiveness of compassion-based mindfulness interventions on loneliness did not account for additional mental health conditions (Dodds et al., 2015; Mascaro et al., 2018; Teoh et al., 2021). As previously mentioned, there are established relationships between loneliness and depression, anxiety, and PTSS (Cacioppo et al., 2009; Cacioppo et al., 2006b; Chang, 2018;

Maes et al., 2019a; Solomon et al., 2015; Weeks et al., 1980). Additionally, EA is associated with higher levels of symptom severity for depression, anxiety, and PTSD (Fledderus et al., 2010; Shi et al., 2016; Spinhoven et al., 2014). Considering these significant relationships, the current study controlled for symptoms of depression, anxiety, and PTSD. This allowed for the current study to assess the effect of the brief self-compassion mindfulness intervention on loneliness and EA while controlling for additional psychological distress.

The Current Study

The current research study implemented a self-guided self-compassion intervention to assess its effectiveness in the relationship between pre- and postintervention ratings of loneliness and experiential avoidance (EA), controlling for psychopathology (i.e., depression, anxiety, PTSS).

Study Hypotheses

1. Measured at baseline, loneliness will be positively associated with psychopathology.
 - a. Loneliness will be positively associated with scores of depression.
 - b. Loneliness will be positively associated with scores of anxiety.
 - c. Loneliness will be positively associated with scores of PTSS.
2. Measured at baseline, loneliness will be positively associated with EA.
3. The self-compassion intervention will show greater improvements compared to the control condition (i.e., progressive muscle relaxation).

- a. Those that engage in self-compassion will report lower levels of loneliness (from pre- to post-intervention) compared to those in the control condition, controlling for baseline psychopathology (i.e., depression, anxiety, PTSS).
- b. Those that engage in self-compassion will report lower levels of EA (from pre- to postintervention) compared to those in the control condition.
- c. Change in EA scores (from pre- to postintervention) will mediate the association between condition (self-compassion versus progressive muscle relaxation) and loneliness.

CHAPTER 3

METHOD

Participants

Data were collected from 190 students (64.7% female) enrolled in an introductory psychology course at a Midwestern university. It was previously decided that students who did not complete all three intervention exercises and the post-intervention survey within 24 hours of receiving the notification would be excluded ($n = 76$). An additional three students were eliminated from the analyses due to completing the post-intervention questionnaire in less than five minutes. Another seven students were eliminated due to having above 50% of a questionnaire incomplete. The final sample size was 104 participants ($M_{\text{age}} = 19.09$, $SD = 1.29$, range 18 – 24) with 47 students in the self-compassion intervention condition and 57 students in the progressive muscle relaxation control condition. This final sample size exceeded the proposed sample size of 40 for each condition that was determined by G*power analyses based on a medium effect size from Teoh et al. (2021; mean group difference for intervention condition was 6.05; 95% CI: 2.58, 9.53; Faul et al., 2007, 2009).

Most participants identified as White (42.6%), followed by Black (38.9%), Asian (4.6%), American Indian or Alaska Native (1.9%), and Pacific Islander (0.9%); twelve participants (11.1%) preferred not to respond on this item. The majority of participants were non-Hispanic (76.9%); 20.4% of the sample was Hispanic and 2.8% preferred to not respond. The sample was mostly single (85.2%), unemployed (54.6%), freshman (62.0%; sophomore = 20.4%; junior =

13.9%; 4+ years = 3.7%) with no children (98.1%). All participants were at least 18 years of age, owned an electronic device to complete the daily exercises, and were granted eight research credits towards their psychology course for participating.

Materials

Baseline Questionnaires

Demographics

Participants completed a demographic questionnaire asking about gender, race/ethnicity, age, education level, and prior or current therapy treatment. The purpose of this information was to assess for similarities and differences between conditions (i.e., intervention versus control) and confounding variables that should be statistically controlled.

11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS; Lee & Cagle, 2017)

The R-UCLA-LS is one of the most commonly used self-report questionnaires to measure trait loneliness (Russell et al., 1980). Lee and Cagle (2017) reduced the 20-item R-UCLA-LS to include 11-items, 7 positively worded and 4 negatively worded. Each item is rated on a 3-point scale (i.e., 1 = *hardly ever or never*, 3 = *often*) to reflect the item's overall presence. Scores are interpreted to be one total score representing overall loneliness severity (Russell et al., 1980). Considering the current study examined change in loneliness ratings, the 11-item R-UCLA-LS was used to focus on indicators of affective loneliness, which may be a better measure of state loneliness (as opposed to trait; Lee & Cagle, 2017; Tam & Chanc, 2019). This questionnaire demonstrates adequate internal consistency ($\alpha = .87$; Lee & Cagle, 2017).

Literature supports that this 11-item measure is a unidimensional measure of loneliness; however, content and construct validity has not yet been well established (Hawthorne, 2008; Sansoni et al., 2010; Steed et al., 2007). Baseline loneliness severity was computed using a total score and demonstrated adequate internal consistency in the present study ($\alpha = .89$). The average baseline loneliness score was 19.47 ($SD = 5.63$).

Depression Anxiety Stress Scales – Short Form (DASS-21; Lovibond & Lovibond, 1995)

The DASS-21 includes three scales, measuring depression, anxiety, and stress. The scale includes a total of 21 items rated on a 4-point scale from 0 (*Never*) to 3 (*Almost Always*) in which participants rate how much a statement applies over the last week. Scores represent three psychological constructs, each measured by seven items: Depression, Anxiety, and Stress (Gomez et al., 2014; Lovibond & Lovibond, 1995; Osman et al., 2012). The DASS-21 has been found to have good psychometric properties for clinical and nonclinical samples for consistency: internal consistency ($\alpha = .82$ to $.97$), test-retest reliability across three weeks ($r = .98$ for each subscale; Akin & Cetin, 2007) and three months ($\chi^2 = 16.77$, n.s.; Gomez et al., 2014). The measure has also been observed to have good validity; specifically, convergent validity between the DASS-21 depression and BDI ($r = .74$) and DASS-21 anxiety and BAI ($r = .81$). Per the measure instructions, baseline depression scores for the current study were computed using a total score for the subscale and multiplied by two with an excellent reliability score ($\alpha = .92$; Lovibond & Lovibond, 1995). The average depression score was 7.56 ($SD = 9.75$). Baseline anxiety scores were computed for the current study using a total score for the subscale with a good reliability score ($\alpha = .81$; Lovibond & Lovibond, 1995). The average anxiety score was 6.00 ($SD = 7.01$).

Brief Experiential Avoidance Questionnaire (BEAQ; Gamez et al., 2014).

The BEAQ measures experiential avoidance (EA). The questionnaire includes 15 statements for which participants rate on a 6-point scale from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*) how much each statement applies to them. Scores can be interpreted as one total score of EA or broken into the factors of EA (i.e., behavioral avoidance, distress aversion, procrastination, distraction and suppression, repression and denial, and distress endurance; Gamez et al., 2011). Gamez et al. (2014) reported that the BEAQ demonstrated good psychometric properties: internal consistency ($\alpha = .80-.86$), convergent validity between the BEAQ and other EA measures such as the Multidimensional Experiential Avoidance Questionnaire (MEAQ; $r = .80$) and Acceptance and Action Questionnaire (AAQ) and AAQ-II (mean $r = .66$) and discriminant validity from neuroticism ($r = .41$) and negative affect ($r = .36$), Big Five Inventory for extraversion ($r = -.29$), openness ($r = -.18$), agreeableness ($r = -.27$), and conscientiousness ($r = -.28$). The current study interpreted the questionnaire as one total score of EA with higher scores indicating increased EA with a good reliability score ($\alpha = .83$; Gamez et al., 2014). The average EA score was 50.65 ($SD = 11.83$).

Life Events Checklist (LEC; Weathers, Blake, et al., 2013)

The LEC assesses exposure (e.g., direct, witness, or learned about) to 16 traumatic events (e.g., natural disasters, motor vehicle accidents, physical and sexual assault). The LEC is best used to assess for Criterion A (i.e., index traumatic event) prior to diagnosing or assessing for PTSD symptom severity. Therefore, in the current study, the LEC was used in accordance with an additional questionnaire measuring PTSD symptom severity. This questionnaire (i.e.,

LEC) is shown to have acceptable test-retest reliability across one week ($r = .82$) and internal consistency across items (mean $k = .61$). The lower Kappa and correlation coefficients may represent the low base rates in experiencing and reporting the different traumatic events listed on the LEC (e.g., exposure to a toxic substance and severe human suffering; Gray et al., 2004). This measure was used to identify a traumatic event that meets diagnostic criteria for PTSD and was not included in data analyses.

Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5; Weathers, Litz, et al., 2013).

The PCL-5 is one of the most widely used self-report questionnaires for assessing PTSD symptoms. The questionnaire consists of 20 items, each directly measuring each of the 20 symptoms for PTSD defined in the DSM-5 (APA, 2013). Items are rated on a 5-point scale to reflect the symptom's presence during the prior month (i.e., 1 = *not at all*, 5 = *extremely*). Scores can be interpreted in several ways: total score, symptom cluster, or possible PTSD diagnosis (Weathers, Litz, et al., 2013). The PCL-5 demonstrated good psychometric properties: internal consistency ($\alpha = .94$), inter item consistency (correlations α ranged from .17 to .77), test-retest reliability across a 1-week period ($r = .82$), convergent validity between the PCL-5 and PCL ($r = .85$), PDS ($r = .85$), and DAPS ($r = .84$), and discriminant validity against depression ($r = .60$), Antisocial Personality ($r = .39$), and Mania ($r = .31$; Blevins et al., 2015). In the current study, PTSS was computed using a total symptom severity score for ratings from the past month about the worst event identified by the LEC with excellent reliability score ($\alpha = .95$; Weathers, Blake, et al., 2013). The average PTSS score was 15.47 ($SD = 15.49$).

Post-Intervention Questionnaires

Post-intervention questionnaires were completed seven days after the baseline session and included the 11-item R-UCLA-LS and BEAQ. The questionnaires asked specifically how the participant had been thinking, feeling, and reacting in the last three days (i.e., three days since the last intervention exercise). The average post-intervention loneliness severity (computed using a total score) was 17.12 ($SD = 4.78$) with an adequate reliability score ($\alpha = .87$). The average post-intervention EA score (computed using a total score) was 49.28 ($SD = 12.24$) with an adequate reliability score ($\alpha = .86$).

Intervention

Self-Compassion Intervention

The self-compassion mindfulness exercise included components such as psychoeducation (e.g., self-kindness, common humanity, mindfulness; Cassisa & Neff, 2019) and techniques to implement and increase compassion, love, and kindness towards oneself (Long & Neff, 2018). The exercise was a 20-minute audio clip narrated by a female voice. The protocol was developed by Kristin Neff (2003) to increase the skill, technique, and use of compassion in times of emotional suffering. It was recommended for participants to find a quiet space alone for the duration of the exercise. As determined by committee during the study proposal stage, participants were asked to complete the exercise once daily (we did not specify the time of day the intervention will be completed) for the duration of three days. The audio file link for the exercise can be found in Appendix A.

Control Condition Intervention

The control condition completed a 16-minute audio clip for progressive muscle relaxation (Jacobson, 1929). The intervention teaches one how to relax different muscle groups and learn diaphragmatic breathing. The audio file was made public from The Newcastle upon Tyne Hospitals and was narrated by a female voice in a British accent. By completing a different exercise, the current study can account for both time spent to complete the intervention as well as potential confounding variables such as the use of technology and audio clips and completing a relaxation mindfulness-based intervention (Teoh et al., 2021). The audio file link for the exercise can be found in Appendix A.

Procedure

Participants included undergraduate students recruited from the Psychology 102 subject pool. The first session was in-person, describing the study design, randomly assigning the participant to either the intervention or control condition, and completing the baseline questionnaires (i.e., BEAQ, LEC, PCL-5, DASS-21, 11-item R-UCLA-LS; Appendix B). The LEC was completed to identify the index traumatic event to assess current PTSS; the questionnaire was not included in analyses. After the first session, participants were partially debriefed by a research assistant to explain the purpose of the study and were provided a list of mental health resources in case of psychological distress (Appendices C and D). For the following three days, participants were emailed a survey link (i.e., Qualtrics) at 8am CST daily which contained instructions and the audio recording for either the self-compassion mindfulness exercise or control (i.e., progressive muscle relaxation) to complete once a day. Participants were

also sent a reminder email to complete the exercise at 8pm CST daily. To ensure that the participant fully completed the exercise, participants were asked to email the researcher (after completing each exercise) whether the exercise was easy, difficult, or in between. In an attempt to retain participants in the study, participants earned one entry in a drawing for one of two \$50 Amazon gift cards for each day that they completed the exercise, as well as the post-intervention questionnaires, providing the opportunity to earn up to four entries. The drawing for the gift card winners was conducted at the conclusion of data collection. Approximately one week after completing the baseline questionnaires (i.e., three days following completing the intervention exercises), participants were emailed to request completion of questionnaires assessing for loneliness and EA (i.e., BEAQ, 11-item R-UCLA-LS) inquiring about how they have been thinking, feeling, and reacting since the intervention. At the end of the study (i.e., after the completion of the post-intervention questionnaires), participants were given course credit on SONA and emailed a debriefing form (Appendix E) and counseling resources (see Appendix D).

CHAPTER 4

RESULTS

Data Screening and Correlations

Prior to analyzing the data, percentage of missing values for each study variable and missing value analysis results are documented in Table 1. Of note, the missing value analysis was not statistically significant ($\chi^2(1, N = 40) = 40.810, p = .435$) indicating that missing values were completely at random (Little, 1988; Table 2). Descriptive statistics and correlations among study variables were examined and are documented in Table 3. Among baseline variables, both loneliness and EA scores showed significant zero-order correlations with all forms of psychopathology assessed in the study (PTSS, depression, and anxiety). Post-intervention loneliness and EA ratings showed significant zero-order correlations with all baseline variables (loneliness, EA, PTSS, depression, and anxiety).

All analyses used bootstrapping which resamples the dataset with simulated samples and provides the sampling distribution of the mean. Bootstrapping is robust against skew and non-normal distributions, meaning that skewed and non-normal variables were not transformed. For descriptive purposes, the values for skewness and kurtosis are provided in Table 4. The Boxplot method was then used to identify outliers within each study variable. As recommended by Hayes (2013), any score that was above three standard deviations from the mean was changed to three standard deviations (i.e., winsorizing). This guideline led to 11 values (i.e., three values for baseline PTSS, four values for baseline depressive symptom severity, three values for baseline

anxiety symptom severity, and one value for post-intervention loneliness score) being adjusted to three standard deviations above the mean.

Table 1
Missing Values and MCAR Statistics

Scale	Missing Count	Missing Percentage	Estimated Means	Estimated Standard Deviations
1. Pre-L	2	1.9	19.48	5.64
2. Pre-EA	5	4.8	50.64	11.78
3. Pre-Dep	0	0.0	3.73	4.88
4. Pre-Anx	0	0.0	3.00	3.50
5. Pre-PTSS	4	3.8	15.77	15.55
6. Post-L	3	2.9	17.12	4.75
7. Post-EA	8	7.7	49.43	12.15

Note. Pre-L = Baseline 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Pre-EA = Baseline Brief Experiential Avoidance Questionnaire (BEAQ) sum; Pre-Dep = Baseline Depression Anxiety Stress Scales – Short Form (DASS-21) Depression subscale sum; Pre-A = Baseline DASS-21 Anxiety Subscale sum; Pre-PTSS = Baseline PTSD Checklist for DSM-5 (PCL-5) sum; Post-L = Post-intervention R-UCLA-LS sum; Post-EA = Post-intervention BEAQ sum

Table 2
Estimated Mean Covariances

Scale	1	2	3	4	5	6	7
1. Post-L	22.58	--	--	--	--	--	--
2. Post-EA	18.68	147.65	--	--	--	--	--
3. Pre-PTSS	22.94	89.42	241.74	--	--	--	--
4. Pre-Dep	7.69	28.17	46.40	23.77	--	--	--
5. Pre-A	2.91	18.20	34.10	12.36	12.28	--	--
6. Pre-EA	19.77	101.94	77.42	26.03	15.89	138.73	--
7. Pre-L	18.18	22.38	33.90	12.38	5.87	22.04	31.82

Note. Pre-L = Baseline 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Pre-EA = Baseline Brief Experiential Avoidance Questionnaire (BEAQ) sum; Pre-Dep = Baseline Depression Anxiety Stress Scales – Short Form (DASS-21) Depression subscale sum; Pre-A = Baseline DASS-21 Anxiety Subscale sum; Pre-PTSS = Baseline PTSD Checklist for DSM-5 (PCL-5) sum; Post-L = Post-intervention R-UCLA-LS sum; Post-EA = Post-intervention BEAQ sum

Little's MCAR test: Chi-Square = 40.81, DF = 40, $p = .435$

Table 3

Descriptive Statistics and Bivariate Correlations Among Daily Study Variables

Scale	1	2	3	4	5	6	7
1. Pre-L	--						
2. Pre-EA	.335**	--					
3. Pre-Dep	.455**	.459**	--				
4. Pre-Anx	.301**	.392**	.723**	--			
5. Pre-PTSS	.366**	.407**	.608**	.624**	--		
6. Post-L	.682**	.368**	.349**	.195	.307**	--	
7. Post-EA	.332**	.721**	.485**	.433**	.459**	.327**	--
<i>Min</i>	11	20	0	0	0	11	18
<i>Max</i>	31.00	80.00	35.92	27.38	58.48	30.13	72.00
<i>Mean</i>	19.47	50.65	7.46	6.00	15.47	17.12	49.28
<i>SD</i>	5.63	11.83	9.75	7.01	15.49	4.78	12.24
<i>N</i>	102	99	104	104	100	101	96

Table 4

Test of Normality Significance Results

Scale	KS_C	KS_C	KS_T	KS_T	SW_C	SW_C	SW_T	SW_T	df
	Statistic	Sig	Statistic	Sig	Statistic	Sig	Statistic	Sig	
1. Post-L	.146	.018	.125	.091	.921	.004	.925	.008	45(C);43(T)
2. Post-EA	.089	.200	.097	.200	.967	.216	.971	.350	45(C);43(T)
3. Pre-PTSS	.182	.001	.221	<.001	.809	<.001	.801	<.001	45(C);43(T)
4. Pre-Dep	.207	<.001	.249	<.001	.791	<.001	.713	<.001	55(C); 49(T)
5. Pre-A	.203	<.001	.188	<.001	.797	<.001	.827	<.001	55(C); 49(T)
6. Pre-EA	.062	.200	.140	.035	.992	.988	.964	.186	45(C);43(T)
7. Pre-L	.125	.076	.097	.200	.932	.011	.948	.051	45(C);43(T)

Note. Pre-L = Baseline 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Pre-EA = Baseline Brief Experiential Avoidance Questionnaire (BEAQ) sum; Pre-Dep = Baseline Depression Anxiety Stress Scales – Short Form (DASS-21) Depression subscale sum; Pre-A = Baseline DASS-21 Anxiety Subscale sum; Pre-PTSS = Baseline PTSD Checklist for DSM-5 (PCL-5) sum; Post-L = Post-intervention R-UCLA-LS sum; Post-EA = Post-intervention BEAQ sum; KS_C = Kolmogorov-Smirnov normality test for control condition; KS_T = Kolmogorov-Smirnov normality test for treatment condition; SW_C = Shapiro-Wilk normality test for control condition; SW_T = Shapiro-Wilk normality test for treatment condition

Condition Differences and Covariates

Comparing the two conditions (i.e., intervention and control), there were no significant differences based on gender ($\chi^2(1, N = 40) = 3.497, p = .174$), baseline PTSS ($t(98) = -0.221, p = .825$), depression ($t(102) = 0.595, p = .553$), anxiety ($t(102) = 0.242, p = .809$), loneliness ($t(100) = -0.700, p = .485$), or EA ($t(97) = 1.124, p = .264$).

As research indicates mixed findings regarding gender effects and loneliness (Maes et al., 2019b; Masi et al., 2011), the current study analyzed the relationship between gender and baseline loneliness and EA. Baseline loneliness ratings significantly differed by gender ($t(99) = -2.017, p = .046$) such that females reported higher loneliness ($M = 20.15, SD = 5.60$) compared to males ($M = 17.82, SD = 5.21$). Baseline EA ratings also significantly differed by gender ($t(96) = -3.368, p = .001$) such that females reported higher EA ($M = 53.39, SD = 11.84$) compared to males ($M = 45.32, SD = 10.16$). Due to significant differences in these study variables based on gender (i.e., loneliness, EA), gender was included as a covariate in all inferential analyses.

Hypothesis Analysis

Hypothesis 1: Baseline Psychopathology Associated with Loneliness Levels

The first hypothesis examined the relationship between loneliness and psychopathology (i.e., PTSS, depression, and anxiety scores) measured at baseline and was tested using linear regression with bootstrapping (with 10,000 simulated samples and 95% confidence intervals). The hypothesis examined the relationship between loneliness and psychopathology such that loneliness would be positively associated with depression (1a), anxiety (1b), and PTSS (1c). The results can be found in Table 5.

Table 5

Linear Regression Psychopathology Predictors of Baseline Loneliness

Outcome					
Predictor					
<i>Covariate</i>	<i>B</i>	<i>SE</i>	<i>p</i> -value	<i>Lower CI</i>	<i>Upper CI</i>
Pre_Loneliness					
Pre-Depression	0.242	0.046	< .001	0.151	0.333
<i>Gender</i>	1.526	1.052	.151	-0.641	3.489
Pre-Anxiety	0.196	0.075	.008	0.047	0.340
<i>Gender</i>	1.632	1.163	.166	-0.673	3.902
Pre-PTSS	0.121	0.038	.002	0.046	0.194
<i>Gender</i>	0.935	1.121	.409	-1.292	3.073

Hypothesis 1a: Loneliness Associated with Depression. Using linear regression with bootstrapping, loneliness was entered as the dependent variable, depression as the independent variable, and gender as a covariate. Results indicated that there was a significant positive association between baseline loneliness and depression ($B = 0.242$, CI [.1511, 0.333], $p < .001$).

Hypothesis 1b: Loneliness Associated with of Anxiety. Using linear regression with bootstrapping, loneliness was entered as the dependent variable, anxiety as the independent variable, and gender as a covariate. Results indicated that there was a significant positive association between baseline loneliness and anxiety ($B = 0.196$, CI [.047, 0.340], $p = .008$) as the confidence interval did not span zero.

Hypothesis 1c: Loneliness Associated with PTSS. Using linear regression with bootstrapping, loneliness was entered as the dependent variable, PTSS as the independent variable, and gender as a covariate. The confidence interval did not span zero, meaning the null hypothesis was rejected and a significant positive association between baseline loneliness and PTSS was observed ($B = 0.121$, CI [.046, 0.194], $p = .002$).

Hypothesis 2: Baseline Experiential Avoidance Predicting Loneliness Levels

The second hypothesis investigated the relationship between loneliness and EA. It was predicted that total scores of loneliness would be positively associated with EA (i.e., total score on the BEAQ). Gender, depression, anxiety, and PTSS were entered as covariates. The second hypothesis was analyzed using linear regression with bootstrapping (with 10,000 simulated samples and 95% confidence intervals) with loneliness as the dependent variable and EA as the independent variable. Results concluded that there was not a significant association ($B = 0.043$, $CI [-.084, 0.149]$, $p = .478$) such that when controlling for gender and baseline psychopathology, EA did not predict loneliness. The results can be seen in Table 6.

Table 6

Linear Regression Experiential Avoidance Predicting Baseline Loneliness

Outcome					
Predictor					
<i>Covariate</i>	<i>B</i>	<i>SE</i>	<i>p-value</i>	<i>Lower CI</i>	<i>Upper CI</i>
Pre_Loneliness					
Pre-EA	0.043	0.060	.478	-0.084	0.149
<i>Pre-Depression</i>	0.229	0.079	.407	-1.460	3.377
<i>Pre-Anxiety</i>	-0.065	0.117	.574	-0.308	0.145
<i>Pre-PTSS</i>	0.031	0.048	.503	-0.054	0.135
<i>Gender</i>	1.036	1.235	.407	-1.460	3.377

Note. Pre-Loneliness = Baseline 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Pre-EA = Baseline Brief Experiential Avoidance Questionnaire (BEAQ) sum; Pre-Depression = Baseline Depression Anxiety Stress Scales – Short Form (DASS-21) Depression subscale sum; Pre-Anxiety = Baseline DASS-21 Anxiety Subscale sum; Pre-PTSS = Baseline PTSD Checklist for DSM-5 (PCL-5) sum.

Hypothesis 3: Changes by Condition

Hypothesis 3a-c examined the effect of the self-compassion intervention on loneliness and EA when compared to the control condition, controlling for gender and baseline symptoms

of depression, anxiety, and PTSD. These analyses were completed using PROCESS with bootstrapping (with 10,000 simulated samples and a 95% confidence interval). First assessing the change from pre- to post-intervention loneliness and EA, a paired samples t-test supported a significant change for loneliness ($t(98) = 5.529, p < .001$) but not EA ($t(91) = 1.352, p = .180$).

Hypothesis 3a: Condition Moderating Loneliness. Hypothesis 3a examined the relationship between pre- and postintervention loneliness scores moderated by condition, controlling for gender and baseline psychopathology (i.e., depression, anxiety, and PTSS). The hypothesis was tested utilizing Model 1 within PROCESS (Hayes, 2013) with baseline loneliness score as the independent variable, post-intervention loneliness score as the dependent variable, and condition as the moderator. Gender and baseline depressive, anxiety, and PTSD symptom severity were included as covariates (Hayes, 2013). Results showed that the relationship between pre- and post-intervention loneliness scores was not moderated by condition ($B = -0.062, CI [-0.324, 0.199], p = .637$) as the confidence interval included zero. However, a significant association between pre- and post-loneliness scores was observed as expected ($B = 0.547, CI [0.343, 0.750], p < .001$). Results can be seen in Table 7.

Table 7

Moderating Effect of Condition on the Relationship Between Baseline and Postintervention Loneliness Ratings

Outcome					Lower	
Predictor	<i>B</i>	SE	<i>t</i>	<i>p</i> -value	CI	Upper CI
Post-Loneliness						
Pre-Loneliness	0.547	0.102	5.347	.013	1.244	10.240
Condition	1.388	2.643	0.525	.601	-3.865	6.642
Interaction	-0.062	0.132	-0.473	.637	-0.324	0.199

Note. Post-Loneliness = Postintervention 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Pre-Loneliness = Baseline 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Condition = treatment compared to control condition.

Hypothesis 3b: Condition Moderating Experiential Avoidance. Hypothesis 3b compared the relationship between pre- and postintervention EA scores between the self-compassion intervention and control condition, controlling for gender and baseline psychopathology (i.e., depression, anxiety, and PTSS). The hypothesis was also tested utilizing Model 1 within PROCESS (Hayes, 2013) with baseline EA score as the independent variable, post-intervention EA as the dependent variable, and condition as the moderator. Results concluded that the relationship between pre- and postintervention EA scores was not moderated by condition ($B = -0.093$, CI [-0.393, 0.207], $p = .541$) as the confidence interval included zero. However, a significant association between pre- and post-EA scores was observed as expected ($B = 0.747$, CI [0.530, 0.964], $p < .001$). Results can be seen in Table 8.

Table 8

Moderating Effect of Condition on the Relationship Between Baseline and Postintervention Experiential Avoidance Ratings

Outcome					Lower	Upper
Predictor	<i>B</i>	SE	<i>t</i>	<i>p</i> -value	CI	CI
Post-EA						
Pre-EA	0.747	0.109	6.830	<.001	0.529	0.964
Condition	5.268	7.833	0.673	.503	-10.301	20.837
Interaction	-0.093	0.151	-0.614	.541	-0.393	0.207

Note. Post-EA = Postintervention Brief Experiential Avoidance Questionnaire (BEAQ) sum; Pre-EA = Baseline Brief Experiential Avoidance Questionnaire (BEAQ) sum; Condition = treatment compared to control.

Hypothesis 3c: Experiential Avoidance Mediating the Difference Between Condition and Loneliness. Lastly, hypothesis 3c predicted that change in EA scores (from pre- to postintervention) would mediate the association between condition and loneliness. This

hypothesis was analyzed utilizing Model 4 in PROCESS (Hayes, 2013) to estimate indirect effects. The independent variable was condition, the mediator was EA score change (from pre- to postintervention scores), and the dependent variable was post-intervention loneliness score. Gender, as well as baseline scores for depressive, anxiety, and PTSS scores, were included as covariates. Results indicated that EA change did not mediate the association between condition and loneliness ($B = -0.032$, CI $[-0.279, 0.301]$, $p > .05$) as the confidence interval included zero. Results can be seen in Table 9.

Table 9

Mediating Effect of Experiential Avoidance Change on the Relationship Between Condition and Postintervention Loneliness Ratings

Outcome Predictor	<i>B</i>	SE	<i>t</i>	<i>p</i> -value	Lower CI	Upper CI
Post-Loneliness						
Condition	0.842	0.974	0.864	.390	-1.097	2.781
EA_change	-0.003	0.052	-0.048	.962	-0.106	0.101
Indirect effect	-0.003	0.131	--	>.05	-0.279	0.301

Note. Post-Loneliness = Postintervention 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Condition = treatment compared to control; EA_change = change in experiential avoidance rating (from pre- to postintervention).

Post Hoc Analyses

Post hoc analyses were run to examine whether results remained consistent without inclusion of covariates for the proposed analyses. Additional analyses were run to examine the relationship between pre- and postintervention scores between the self-compassion intervention and control condition (3d, 3e). Variable mean and standard deviations for all variables by condition and time are presented in Table 10.

Table 10

Variable Means and Standard Deviations by Condition and Time

Measure	Self-Compassion		PMR	
	Pre- Intervention <i>M</i> (<i>SD</i>)	Post- Intervention <i>M</i> (<i>SD</i>)	Pre- Intervention <i>M</i> (<i>SD</i>)	Post- Intervention <i>M</i> (<i>SD</i>)
Loneliness	19.88(5.84)	17.34(4.88)	19.09(5.45)	16.93(4.73)
Experiential Avoidance	49.27(11.63)	48.66(12.25)	51.94(11.98)	49.88(12.33)
Anxiety	5.82(6.59)	--	6.16(7.42)	--
Depression	6.85(9.76)	--	8.00(9.80)	--
PTSS	15.84(15.07)	--	15.15(15.99)	--

Note. Loneliness = 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Experiential Avoidance = Brief Experiential Avoidance Questionnaire (BEAQ) sum; Anxiety = Depression Anxiety Stress Scales – Short Form (DASS-21) Anxiety subscale sum; Depression = DASS-21 Depression Subscale sum; PTSS = PTSD Checklist for DSM-5 (PCL-5) sum

Hypothesis 1: Baseline Psychopathology Associated with Loneliness Levels

The first hypothesis examined the relationship between loneliness and psychopathology (i.e., PTSS, depression, and anxiety scores) measured at baseline and was tested using linear regression with bootstrapping (with 10,000 simulated samples and 95% confidence intervals). The hypothesis examined the relationship between loneliness and psychopathology such that loneliness would be positively associated with depression (1a), anxiety (1b), and PTSS (1c). These analyses did not include covariates. Results remained the same as when including gender as a covariate. All findings indicated a significant association between baseline loneliness and anxiety ($B = 0.241$, CI [.099, 0.373], $p < .001$), depression ($B = 0.261$, CI [.169, 0.350], $p < .001$), and PTSS ($B = 0.133$, CI [.062, 0.204], $p < .001$) as the confidence intervals did not span zero. Results can be found in Table 11.

Table 11

Linear Regression Psychopathology Predictors of Baseline Loneliness Without Covariates

Outcome Predictor	<i>B</i>	SE	<i>p</i> -value	<i>Lower CI</i>	<i>Upper CI</i>
Pre_Loneliness					
Pre-Depression	0.261	0.046	< .001	0.169	0.350
Pre-Anxiety	0.241	0.070	<.001	0.099	0.373
Pre-PTSS	0.133	0.036	<.001	0.062	0.204

Note. Pre-Loneliness = Baseline 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Pre-Depression = Baseline Depression Anxiety Stress Scales – Short Form (DASS-21) Depression subscale sum; Pre-Anxiety = Baseline DASS-21 Anxiety Subscale sum; Pre-PTSS = Baseline PTSD Checklist for DSM-5 (PCL-5) sum.

Hypothesis 2: Baseline Experiential Avoidance Predicting Loneliness Levels

The second hypothesis investigated the relationship between loneliness and EA. The second hypothesis was analyzed using linear regression with bootstrapping (with 10,000 simulated samples and 95% confidence intervals) with loneliness as the dependent variable and EA as the independent variable. No covariates were included in the analyses. Results concluded that there was a significant association between baseline loneliness and EA ($B = 0.152$, $CI [0.059, 0.247]$, $p = .003$). Results can be seen in Table 12.

Table 12

Linear Regression Experiential Avoidance Predicting Baseline Loneliness

Outcome Predictor	<i>B</i>	SE	<i>p</i> -value	<i>Lower CI</i>	<i>Upper CI</i>
Pre_Loneliness					
Pre-EA	0.152	0.048	.003	0.059	0.247

Note. Pre-Loneliness = Baseline 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Pre-EA = Baseline Brief Experiential Avoidance Questionnaire (BEAQ) sum; Pre-Depression = Baseline Depression Anxiety Stress Scales – Short Form (DASS-21) Depression subscale sum; Pre-Anxiety = Baseline DASS-21 Anxiety Subscale sum; Pre-PTSS = Baseline PTSD Checklist for DSM-5 (PCL-5) sum.

Hypothesis 3: Changes by Condition

Hypothesis 3a: Condition Moderating Loneliness. Hypothesis 3a examined the relationship between pre- and postintervention loneliness scores moderated by condition (self-compassion intervention and control condition). The hypothesis was tested utilizing Model 1 within PROCESS (Hayes, 2013) with baseline loneliness score as the independent variable, post-intervention loneliness score as the dependent variable, and condition as the moderator. Without controlling for gender and baseline psychopathology (i.e., depression, anxiety, and PTSS), results showed that the relationship between pre- and postintervention loneliness scores was not moderated by condition ($B = -0.077$, CI [-0.326, 0.172], $p = .541$) as the confidence interval included zero. Results can be seen in Table 13.

Table 13

Moderating Effect of Condition on the Relationship Between Baseline and Postintervention Loneliness Ratings

Outcome Predictor	<i>B</i>	SE	t	<i>p</i> -value	Lower CI	Upper CI
Post-Loneliness						
Pre-Loneliness	0.608	0.090	6.761	<.001	0.429	0.786
Condition	1.553	2.542	0.611	.543	-3.493	6.599
Interaction	-0.077	0.125	-0.614	.541	-0.326	0.172

Note. Post-Loneliness = Postintervention 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Pre-Loneliness = Baseline 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Condition = treatment compared to control condition.

Hypothesis 3b: Condition Moderating Experiential Avoidance. Hypothesis 3b examined the relationship between pre- and postintervention EA scores moderated by condition (self-compassion intervention and control condition). The hypothesis was tested utilizing Model 1

within PROCESS (Hayes, 2013) with baseline EA score as the independent variable, post-intervention EA score as the dependent variable, and condition as the moderator. Without controlling for gender, results showed that the relationship between pre- and postintervention EA scores was not moderated by condition ($B = -0.109$ CI [-0.411, 0.192], $p = .473$) as the confidence interval included zero. Results can be seen in Table 14.

Table 14

Moderating Effect of Condition on the Relationship Between Baseline and Postintervention Experiential Avoidance Ratings

Outcome Predictor	<i>B</i>	SE	<i>t</i>	<i>p</i> -value	Lower CI	Upper CI
Post-EA						
Pre-EA	0.793	0.106	7.489	<.001	0.583	1.004
Condition	5.883	7.882	0.746	.458	-9.782	21.548
Interaction	-0.109	0.152	-0.720	.473	-0.411	0.192

Note. Post-EA = Postintervention Brief Experiential Avoidance Questionnaire (BEAQ) sum; Pre-EA = Baseline Brief Experiential Avoidance Questionnaire (BEAQ) sum; Condition = treatment compared to control condition.

Hypothesis 3c: Experiential Avoidance Mediating the Difference Between Condition and Loneliness. Lastly, hypothesis 3c predicted that change in EA scores (from pre- to postintervention) would mediate the association between condition and loneliness. This hypothesis was analyzed utilizing Model 4 in PROCESS (Hayes, 2013) to estimate indirect effects. The independent variable was condition, the mediator was EA score change (from pre- to postintervention scores), and the dependent variable was post-intervention loneliness score. Without inclusion of covariates (i.e., gender and baseline psychopathology), results indicated that EA change did not mediate the association between condition and loneliness ($B = -0.002$, CI [-0.306, 0.244], $p > .05$) as the confidence interval included zero. Results can be seen in Table 15.

Table 15

Mediating Effect of Experiential Avoidance Change on the Relationship Between Condition and Postintervention Loneliness Ratings

Outcome Predictor	<i>B</i>	SE	<i>t</i>	<i>p</i> -value	Lower CI	Upper CI
Post-Loneliness						
Condition	0.449	1.031	0.435	.664	-1.600	2.497
EA_change	-0.002	0.056	-0.031	.975	-0.114	0.110
Indirect effect	-0.002	0.125	--	>.05	-0.306	0.244

Note. Post-Loneliness = Postintervention 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Condition = treatment compared to control condition; EA_change = change in experiential avoidance rating (from pre- to postintervention)

Hypothesis 3d: Repeated Measures ANOVA for Loneliness. Hypothesis 3d examined the relationship between pre- and postintervention loneliness scores between the self-compassion intervention and control condition. The hypothesis was tested utilizing repeated measures analysis of variance (ANOVA) within SPSS (Hayes, 2013) with preintervention and postintervention loneliness as the two within-subject factors and condition (intervention and control) as the between-subject factor. Results indicated that there was not a statistically significant difference between pre- and post-intervention loneliness on condition, $F(1, 96) = 0.388, p = .535$. The results can be seen in Table 16.

Table 16

Mean Differences Loneliness Between Intervention and Control Condition

Measure	Significance		
	$F(1,96)$	<i>p</i>	η^2
Loneliness	0.388	.535	.004

Note. Loneliness = Postintervention 11-Item UCLA Loneliness Scale-Revised (R-UCLA-LS) sum; Condition = treatment compared to control condition

Hypothesis 3e: Repeated Measures ANOVA for Experiential Avoidance. Hypothesis 3e examined the relationship between pre- and postintervention experiential avoidance scores between the self-compassion intervention and control condition, controlling for gender. The hypothesis was tested utilizing repeated measures ANOVA within SPSS (Hayes, 2013) with pre-intervention and post-intervention experiential avoidance as the two within-subject factors and condition (intervention and control) as the between-subject factor. Results indicated that there was not a statistically significant difference between pre- and post-intervention experiential avoidance on condition, $F(1, 89) = 0.799, p = .374$. Results can be seen in Table 17.

Table 17

Mean Differences of Experiential Avoidance Between Intervention and Control Condition

Measure	Significance		
	$F(1,89)$	p	η^2
Experiential Avoidance	0.799	.374	.009

Note. Experiential Avoidance = Post-intervention Brief Experiential Avoidance Questionnaire (BEAQ) sum; Condition = treatment compared to control condition

CHAPTER 5

DISCUSSION

The current study examined the relationship between loneliness and experiential avoidance (EA) within a sample of undergraduate students. Specifically, the study aimed to assess whether participating in a self-guided self-compassion intervention would improve ratings of loneliness and EA, compared to a control condition that practiced progressive muscle relaxation.

Loneliness has been conceptualized as distress related to the discrepancy between perceived and desired social relationship (Russell et al., 1980). Previous literature has demonstrated that chronic loneliness is a risk factor for negative behavioral, cognitive, and psychological outcomes (Cacioppo et al., 2000; Heinrich & Gullone, 2006; Masi et al., 2011; Sin et al., 2021; Tsur et al., 2019). These findings highlight the importance of examining effective interventions to reduce loneliness and address factors that contribute to the longevity of distress (Masi et al., 2011; Rubinstein et al., 1979; Russell et al., 1980). One mechanism that perpetuates loneliness is engagement in unhelpful coping strategies (Shi et al., 2016). One unhelpful coping strategy that lonely individuals are more likely to engage in is EA, or an unwillingness to remain in discomfort (Hayes et al., 1996; Losada et al., 2015; Ortega-Jimenez et al., 2021).

Interventions targeting EA often incorporate the practice of mindfulness. EA interventions typically focus on increasing an individual's education in regard to mindfulness and on implementing approach behaviors (Chawla & Ostafin, 2007). A meta-analysis examining

the effectiveness of mindfulness interventions on loneliness concluded that a cognitive behavioral compassion therapy intervention had the strongest effect on reducing distress (Teoh et al., 2021). Cognitive behavioral compassion therapy focuses on building skills, such as emotional awareness, through mindfulness practices. These skills aim to improve attentional stability and awareness without judgment during compassion practices (Dodds et al., 2015; Mascaro et al., 2018; Teoh et al., 2021). Though literature indicates that compassion-focused mindfulness interventions may decrease loneliness, there is a gap regarding whether the effect is observed when the self-compassion exercise is self-guided. If a self-guided self-compassion mindfulness exercise significantly reduces loneliness, it may provide greater opportunity for populations that lack access to psychological services. Specifically, this intervention may provide access to those who are unable or unwilling to receive therapeutic services to address distress that results from loneliness.

Primary Findings

The first hypothesis in the current study examined whether loneliness was associated with psychopathology, such as depression, anxiety, and PTSD. Findings indicated a statistically significant relationship between loneliness and each of the psychopathological variables. As such, baseline symptoms of psychopathology were included as covariates in inferential analyses to examine the unique contribution of loneliness without the influence of additional psychopathology.

The second hypothesis examined whether baseline loneliness was related to EA. When controlling for baseline psychopathology and gender, there was not a significant association between baseline EA and loneliness. This finding contradicted previous literature in support of

engagement of ineffective coping, including EA, being positively associated with loneliness (Clark et al., 2015; Losada et al., 2015; Ortega-Jimenez et al., 2021; Shi et al., 2016).

The third hypothesis included three components. The first component examined whether the relationship between pre- and postintervention loneliness varied by condition (i.e., self-compassion mindfulness intervention and progressive muscle relaxation control). Results did not support the hypothesis, such that while there was a significant association in loneliness ratings from pre- to postintervention, it did not vary significantly by condition. The second component of the hypothesis examined whether the association in EA (from pre- to postintervention) varied by condition. The hypothesis was not supported. There was a significant association in EA from pre- to postintervention, but the relationship did not vary significantly by condition. The final component analyzed whether change from pre- to postintervention EA mediated the association between condition (i.e., intervention or control) and postintervention loneliness. Change in EA from pre- to postintervention did not significantly mediate the association between condition and post-intervention loneliness.

The post hoc analyses supported that there were significant differences from baseline to post-intervention scores for loneliness but not EA. This finding demonstrates that loneliness may significantly change across one week following brief interventions, but the requirement of a self-compassion component may not be necessary.

Null Findings

The null findings of the current study may be due to several factors, such as the mean scores of the study variables, the study design, and the analyses utilized in the study. Beginning with the means of the psychopathology measures, the null findings may be related to the average

variable scores. In the current study, the average baseline score was 7.46 out of a total score of 42 ($SD = 9.75$) for depression and 6.00 ($SD = 7.01$) for anxiety. Literature supports that depression and anxiety averages within the current study fell within the “normal” range (i.e., total scores from 0-9 for depression and 0-7 for anxiety) meaning that the majority of the sample did not exhibit clinically significant symptoms of depression and anxiety (Lovibond & Lovibond, 1995; Ronk et al., 2013; Sathya et al., 2020).

The average PTSS total score in the current study was 15.47 ($SD = 15.49$). Previous literature recommended a cut-off score of at least 30 to indicate a probable PTSD diagnosis (Blevins et al., 2015; Weathers, Litz, et al., 2013). Applying this cut-off recommendation, 17 participants out of the total sample size of 104 met criteria for PTSD, 73 participants did not meet the cut-off score, and 14 participants had missing values and therefore were not included (Blevins et al., 2015; Weathers, Litz, et al., 2013). Approximately 18.89% of the current sample that endorsed experiencing a traumatic event and completed the entire questionnaire met the cutoff score for PTSD. Considering both the low percentage of participants meeting the recommended cut-off score and the average total score of 15.47, the majority of participants that endorsed experiencing a traumatic event did not report experiencing significant distress. The average levels of baseline psychopathology may indicate that the levels of loneliness distress targeted for the intervention were also minimal. That is, there is limited room for change in distress when distress is minimal at baseline.

Additionally, the average score for loneliness was 19.47 ($SD = 5.63$). Per Lee and Cagle (2017), the average score within an elder sample was 16.40. Literature indicates that loneliness levels increase in elderly populations due to a decrease in social networks (Cooney & Dunne, 2001; Lee & Cagle, 2017; Pinguart & Sorensen, 2001). The current study’s average loneliness

score was slightly above the average within the elderly sample of Lee and Cagle's (2017) study. The current sample's loneliness average score was slightly more elevated than the general population, but not highly lonely. Considering that the sample reported average loneliness scores, it may be unsurprising that scores of EA were also average (i.e., $M = 43.72-48.22$, $SD = 9.75-11.42$; Gamez et al., 2014). Increased loneliness is associated with increased use of EA to cope with the related distress (Bell & Higgins, 2015; Clark et al., 2015; Kashdan et al., 2009; Ortega-Jimenez et al., 2021; Shi et al., 2016). The average loneliness scores may indicate that the individuals were engaging in more helpful coping strategies rather than EA. The average baseline EA scores may have impacted the null findings and limited the interpretation to samples that may be more distressed. That the current sample did not report high distress related to the constructs of interest (i.e., loneliness, EA, and psychopathology) supports that overall, the sample may be relatively healthy and therefore significant change would be difficult to observe. If a population is not reporting significant distress, they may not be motivated to change or improve their ways of coping, such as approaching distress compared to avoiding it (Gamez et al., 2014).

The measures used to capture the constructs may have been another factor contributing to the null findings. Literature measuring loneliness most commonly utilizes the R-UCLA-LS survey (Russell et al., 1980). The items included in R-UCLA-LS as well as the instructions assessing for lifetime responses, may be measuring trait loneliness. However, when assessing state loneliness, the R-UCLA-LS may not be the most appropriate as it includes items that may not change within the timeline of the current study (i.e., one week). Therefore, another version of the R-UCLA-LS was implemented, including 11-items that were rated on a 3-point scale (Lee & Cagle, 2017). Previous literature reported that state loneliness is best captured by minimizing

retrospection when completing the measure (i.e., how have you felt in the last two weeks compared to looking back over your life; Hector-Taylor & Adams, 1996). The current study implemented this recommendation to capture state loneliness by instructing the participants to provide answers about how they have been feeling “since the last exercise.” However, the sensitivity of the measure may not have been enough to assess change across one week. For example, questions such as “people you can talk to,” “people you can turn to,” and “people that really understand you” may be more trait-like and unlikely to change after one week.

In addition, the BEAQ may not have captured change across the one-week study period in regard to how an individual copes with difficult situations. Responses to items such as, “I’m quick to leave any situation that makes me feel uneasy” and “fear or anxiety won’t stop me from doing something important” may change after repeatedly engaging in approach behaviors and reducing avoidant behaviors. The study may need to be conducted over a longer period of time to capture changes in coping.

Another factor that may have led to null findings is lack of differentiation between the two conditions. The intervention selected for the self-compassion mindfulness exercise was created and recorded by Neff, a pioneer in the field of developing and researching self-compassion exercises (Neff, 2003). The control condition listened to a progressive muscle relaxation exercise daily. The difference between the two conditions was the self-compassion component within the intervention condition. The self-compassion component targeted changing mindset, accepting distress and suffering, and remaining in the present (Neff, 2003). The two conditions were similar in that they focused on listening to an exercise daily for three days that relaxed the body. Both exercises are associated with decreased distress (Neff, 2003; Keng et al., 2012; Toussaint et al., 2021).

Toussaint et al. (2021) demonstrated that practicing progressive muscle relaxation exercises is associated with a reduction of pain, tension, and psychological distress (e.g., sleep disorders, anxiety, depression). Literature suggests that mindfulness interventions successfully decrease psychological distress and improve emotion regulation (Keng et al., 2012; Wilson et al., 2019). However, when comparing the effectiveness of a mindfulness intervention to an active control on measures of self-compassion, emotion dysregulation, and psychopathology, there were no significant condition differences (Wilson et al., 2019). This may indicate that self-compassion is one of many helpful strategies that reduce psychological distress (Keng et al., 2012; Wilson et al., 2019). Overall, both self-compassion mindfulness interventions and progressive muscle relaxation exercises successfully decrease physical and emotional distress. This similarity in decreased distress may be one reason condition differences were not observed within the current study (Gao et al., 2018; Keng et al., 2012; Torales et al., 2020; Wilson et al., 2019). The control condition exercise may have been similar to the intervention condition in that it focused on reducing physical distress which may have also reduced loneliness and EA. If the control condition completed a more neutral exercise, such as a 15-minute white noise listening exercise, there may have been greater condition differences.

In addition, these two exercises may be too similar to detect differences within three days (Jacob et al., 2019). Gao et al. (2018) reported that mechanisms of change may differ between a self-guided mindfulness and progressive muscle relaxation exercise across a three-month period of practicing. The three days in which the participants completed the exercises within the current study may not have been long enough to observe significant changes. Literature reveals that a limited dose of an intervention may be beneficial for individuals in the moment, yet the effects decrease rapidly with time (Calma-Birling & Gurung, 2017; Hulsheger et al., 2015). This finding

may indicate that while there was a significant decrease in loneliness and EA across one week, this change may be temporary and more proximal in time to the practice of the exercises. Extending the time for the intervention may bolster the usefulness of self-compassion and the skill of practicing mindfulness in varying situations. Another possible explanation for the change in symptoms may be enhanced awareness of the questionnaire items and content rather than change as an outcome of the intervention (Calma-Birling & Gurung, 2017; Gao et al., 2018; Hulsheger et al., 2015). Further, the current study did not provide the participants psychoeducation about the variables of interest. Without information regarding the construct, the participant may have difficulty recognizing or understanding the strategy, which may introduce noise in measurement.

A final explanation for the null findings may be due to the statistical analyses. The current study proposed to examine the construct of loneliness. Teoh et al. (2021) recommended future studies control for psychopathology, which the current study implemented by controlling for depression, anxiety, and PTSS. Covariates were included to address a gap in the literature and examine whether a self-compassion mindfulness intervention improved loneliness taking into account the overlap loneliness might have with other psychopathology symptoms. However, inclusion of the covariates may have been another factor that led to non-significant results. The covariates increased the precision of the analyses though the study may have been inadequately powered for the analyses. When analyzing the relationship between baseline loneliness and EA without the covariates, there was a significant association. Therefore, it is possible that there is a significant relationship between baseline loneliness and EA, but that the relationship is mainly explained by the covariates. The sample size of the current study may be too small to detect the unique impact of EA on loneliness when controlling for the effects of depression, anxiety, and

PTSS. Inclusion of covariates increases estimate's effect sizes. When covariates are included, it is assumed that they remain constant, which is unlikely in the general population. Additionally, inclusion of the covariates reduces power of the study to detect effects by increasing the standard error of the outcome variable (Lenz & Sahn, 2017; Middleton et al., 2016). The covariates were included in the current study to adjust for the variance of psychological factors when examining change in loneliness specifically. However, with the inclusion of the covariates, the analyses are limited in understanding how the covariates may interact and impact change in the study variables (Kraemer, 2015; Mutz & Pemantle, 2015). Therefore, including the covariates may be limiting the generalizability of the results such that it applies to individuals that endorse higher levels of loneliness with no depressive, anxiety, or PTSS symptoms (Rosenberger & Sverdlov, 2008). From a clinical perspective, it seems unlikely that someone would report heightened loneliness outside the context of other psychological distress. When the analyses were re-run without the inclusion of the covariates, the results remained non-significant except for hypothesis two (examining the association between baseline loneliness and EA). The consistent findings support that condition does not moderate the relationship between baseline and post-intervention loneliness or EA. However, the significant relationship between baseline loneliness and EA without the inclusion of covariates may support an association, and therefore, interventions targeting EA to reduce loneliness.

Limitations

The COVID-19 pandemic may have been a limitation to the current study. At the beginning of the pandemic, many individuals were isolated, which is a risk factor for increased feelings of greater loneliness (Masi et al., 2011; Rubinstein et al., 1979; Russell et al., 1980).

Literature supports that loneliness was highest at the beginning of the pandemic, plateaued as quarantining persisted for additional months, and reduced when the stay-at-home orders began to lift (Killgore et al., 2020; Luchetti et al., 2020). At the time of the current study (i.e., September-December 2021), classes were beginning to occur in person and the strict guidelines of isolation were being relaxed. Therefore, the lower loneliness ratings are consistent with the literature regarding how COVID impacted self-reported loneliness (Killgore et al., 2020; Luchetti et al., 2020).

Similarly, Ferreira et al. (2021) observed that EA was positively associated with psychological distress and negatively associated with well-being within the context of the pandemic. Mayorga et al. (2022) demonstrated that EA was associated with heightened emotional distress related to the pandemic guidelines of stay-at-home orders and social distancing. As previously mentioned, stay-at-home orders were lifting at the time of data collection for the current study, which may be associated with the low averages of EA scores. Considering the lower averages of psychopathology and loneliness reported by the sample, the utilization of EA as a coping strategy may have been lower and less likely to change (Dursun et al., 2022; Ferriera et al., 2021; Mayorga et al., 2022).

Self-compassion was also altered by the pandemic (Deniz, 2021; Guan et al., 2021; Li et al., 2021). Research concluded that decreased self-compassion during the pandemic was associated with increased COVID-related anxiety and lower well-being (Deniz, 2021; Guan et al., 2021; Li et al., 2021). Considering the low averages of psychopathology, loneliness, and EA ratings, the current sample may have been engaging in more effective coping strategies, which decreased COVID-related distress and other psychological distress. A limitation of the study may have been the lack of assessment of COVID and health-related psychological distress to

adjust for when examining the impact of a brief self-compassion intervention on EA and loneliness.

A limitation of loneliness research, and therefore the current study, may be the limited methods of measuring loneliness (Borys & Perlman, 1985; Maes et al. 2019b). Research studies that examine loneliness quantify loneliness severity most commonly through self-report measures (Baumeister et al., 2005; Cacioppo et al., 2009; Cacioppo et al., 2000; Cacioppo et al., 2002; Hawkey et al., 2010; Heinrich & Gullone, 2006; Larose et al., 2002; Masi et al., 2011). Research has not supported other methodologies in assessing for loneliness severity. Some research studies have compared the relationship between a self-report measure of loneliness and physiological outcomes, such as blood pressure, HPA axis reactivity, and autonomic nervous system (Brown et al., 2017; Cacioppo et al., 2003). Other studies have considered the relationship between self-reported loneliness and behavioral outcomes such as isolation and friend nominations (Bell-Dolan et al., 1989; Courtin & Knapp, 2015). But overall, loneliness was measured with self-report measures in the studies (Russell et al., 1980). It may be beneficial for future research to examine the effectiveness of other measure modalities, such as observational and interview.

The study was completed outside of the research laboratory without monitoring. Therefore, there were components that were not controlled. For example, it remains unknown whether participants actually completed the exercise. If they did, it was unknown whether they completed it as instructed without distractions (e.g., watching television). The study attempted to control for exercise completion by assessing the length of time that the participant opened the Qualtrics survey. Although the time spent with the survey open can be assessed, the engagement with the activity cannot be. Additionally, at the end of the final survey, the participants were

asked whether they focused on the exercises when completing them. However, even with this information, it remains unknown whether the participants were fully engaged.

The current study was completed at a university meaning that the participants may not have been motivated to engage in the exercises. The students were completing the study to meet the requirements for completion of an introduction to psychology course. However, the students would receive the necessary credits even if they did not complete all of the study's aspects. Therefore, it cannot be certain that students were honest about completing the exercises. The current study assessed the students that confirmed completing all three exercises (104/190 students). The sample may have been biased towards students with heightened conscientiousness and motivation to complete the study or those with decreased psychological distress and avoidance. Similarly, the design of the study did not allow for flexibility, asking the participants to complete the exercise three days in a row without a day to miss practice, which may have contributed to study attrition.

Implications

The pandemic and resulting stay-at-home orders expanded the health care industry to provide services virtually. These virtual services extended the resource to those unable or unwilling to meet in-person. The current study was the first to examine whether a brief self-guided self-compassion mindfulness intervention significantly reduced feelings of loneliness when compared to a progressive muscle relaxation condition. As the post hoc analyses support, engaging in a brief exercise (e.g., 16-20 minutes) focused on decreasing current physical or emotional distress may impact loneliness within one week. However, these changes may not be significant when accounting for additional mental health conditions such as depression, anxiety,

and PTSD. The type of exercise (i.e., self-compassion or progressive muscle relaxation) was not significantly associated with the relationship in study variables from pre- to postintervention. However, the relationship between pre- and postintervention loneliness was significant, indicating that loneliness may change across one week. However, the focus on self-compassion may not be required.

Future Directions

Addressing the limitations of the current study, future research should expand to samples reporting higher levels of loneliness and EA to assess whether a brief and self-guided intervention significantly reduces elevations in these constructs and/or related distress. Additionally, implementing a different exercise for a control condition that is not associated with reduction of physical distress may provide better understanding as to the mechanisms of change within an intervention (Toussaint et al., 2021). Literature would benefit from additional studies examining the effectiveness of self-compassion within loneliness interventions. The current study attempted to determine whether a convenient (i.e., only requiring internet access) and brief intervention would significantly impact loneliness ratings. Examining whether the duration of the intervention (i.e., three consecutive days compared to 14 days) impacts reductions in loneliness and EA may also provide clarity as to length of time needed to practice a skill before observing changes in cognitive, behavioral, and emotional outcomes. Further assessing the interaction of loneliness with other psychological difficulties may improve targeted interventions for reducing loneliness.

Conclusion

A large percentage of individuals report feelings of loneliness (Shovestul et al., 2020). Loneliness experienced in the short term may be a motivator to engage in strategies to seek support and reduce distress. However, when experienced in the long-term, loneliness is associated with increased reliance on ineffective coping strategies, such as EA. Teoh et al. (2021) reported that the most effective intervention for loneliness included cognitive based compassion therapy, indicating that targeting mindfulness and self-compassion may effectively reduce loneliness. The current study examined whether a brief self-guided self-compassion intervention effectively impacted loneliness and EA in a college sample. The results indicated that while the relationships between pre- and postintervention loneliness and EA were significant across one week, the effect was not significantly related to condition (i.e., intervention versus control). Though results were largely null, the findings demonstrate that a brief self-guided exercise may reduce loneliness in the general population. Future studies may further expand on the type of exercise that is most effective in reducing loneliness within a brief intervention.

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APPENDIX A
INTERVENTION LINKS

Intervention Links:

Self-Compassion Mindfulness Intervention: https://self-compassion.org/wp-content/uploads/2020/08/LKM.self-compassion_cleaned_01-cleanedbydan.mp3

Control (Progressive Muscle Relaxation Group):
<https://www.youtube.com/watch?v=912eRrbes2g>

APPENDIX B
QUESTIONNAIRES

Pre-Intervention 11-item UCLA Loneliness Scale-Revised

Instructions: How much of the time do you feel...:

1 Hardly Ever or Never

2 Some of the Time

3 Often

1. You lack companionship

2. Left out

3. Isolated from others

4. That you are “in tune” with other people

5. Alone

6. That there are people you can talk to

7. That there are people you can turn to

8. That there are people that really understand you

9. That there are people you feel close to

10. Part of a group of friends

11. That you have a lot in common with the people around you

11-item Post-Intervention UCLA Loneliness Scale-Revised

Instructions: **Since the last exercise**, how much of the time did you feel...:

1 Hardly Ever or Never

2 Some of the Time

3 Often

1. You lack companionship

2. Left out

3. Isolated from others

4. That you are “in tune” with other people

5. Alone

6. That there are people you can talk to

7. That there are people you can turn to

8. That there are people that really understand you

9. That there are people you feel close to

10. Part of a group of friends

11. That you have a lot in common with the people around you

Pre-Intervention Brief Experiential Avoidance Questionnaire

Please indicate the extent to which you agree or disagree with each of the following statements.

1 – strongly disagree

2 = moderately disagree

3 = slightly disagree

4 = slightly agree

5 = moderately agree

6 = strongly agree

1. The key to a good life is never feeling any pain
2. I'm quick to leave any situation that makes me feel uneasy
3. When unpleasant memories come to me, I try to put them out of my mind
4. I feel disconnected from my emotions
5. I won't do something until I absolutely have to
6. Fear or anxiety won't stop me from doing something important
7. I would give up a lot not to feel bad
8. I rarely do something if there is a chance that it will upset me
9. It's hard for me to know what I'm feeling
10. I try to put off unpleasant tasks for as long as possible
11. I go out of my way to avoid uncomfortable situations
12. One of my big goals is to be free from painful emotions
13. I work hard to keep out upsetting feelings
14. If I have any doubts about doing something, I just won't do it
15. Pain always leads to suffering

Post-Intervention Brief Experiential Avoidance Questionnaire

Please indicate the extent to which you agree or disagree with each of the following statements in the last three days.

1 – strongly disagree

2 = moderately disagree

3 = slightly disagree

4 = slightly agree

5 = moderately agree

6 = strongly agree

1. The key to a good life is never feeling any pain
2. I'm quick to leave any situation that makes me feel uneasy
3. When unpleasant memories come to me, I try to put them out of my mind
4. I feel disconnected from my emotions
5. I won't do something until I absolutely have to
6. Fear or anxiety won't stop me from doing something important
7. I would give up a lot not to feel bad
8. I rarely do something if there is a chance that it will upset me
9. It's hard for me to know what I'm feeling
10. I try to put off unpleasant tasks for as long as possible
11. I go out of my way to avoid uncomfortable situations
12. One of my big goals is to be free from painful emotions
13. I work hard to keep out upsetting feelings
14. If I have any doubts about doing something, I just won't do it
15. Pain always leads to suffering

Pre-Intervention Depression, Anxiety, and Stress Scale (DASS-21)

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. The rating scale is as follows:

0 Did not apply to me at all - NEVER

1 Applied to me to some degree, or some of the me - SOMETIMES

2 Applied to me to a considerable degree, or a good part of me - OFTEN

3 Applied to me very much, or most of the me - ALMOST ALWAYS

1. I found it hard to wind down

2. I was aware of dryness of my mouth

3. I couldn't seem to experience any positive feeling at all

4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)

5. I found it difficult to work up the initiative to do things

6. I tended to over-react to situations

7. I experienced trembling (e.g., in the hands)

8. I felt that I was using a lot of nervous energy

9. I was worried about situations in which I might panic and make a fool of myself

10. I felt that I had nothing to look forward to

11. I found myself getting agitated

12. I found it difficult to relax

13. I felt down-hearted and blue

14. I was intolerant of anything that kept me from going on with what I was doing

15. I felt I was close to panic

16. I was unable to become enthusiastic about anything

17. I felt I wasn't worth much as a person

18. I felt that I was rather touchy

19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)
20. I felt scared without any good reason
21. I felt that life was meaningless

Life Events Checklist

Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it *happened to you* personally; (b) you *witnessed it* happen to someone else; (c) you *learned about it* happening to a close family member or close friend; (d) you were exposed to it as *part of your job* (for example, paramedic, police, military, or other first responder); (e) you're *not sure* if it fits; or (f) it *doesn't apply* to you.

Be sure to consider your *entire life* (growing up as well as adulthood) as you go through the list of events.

1. Natural disaster (for example, flood, hurricane, tornado, earthquake)
2. Fire or explosion
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)
4. Serious accident at work, home, or during recreational activity
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)
9. Other unwanted or uncomfortable sexual experience
10. Combat or exposure to a war-zone (in the military or as a civilian)
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)
12. Life-threatening illness or injury
13. Severe human suffering
14. Sudden violent death (for example, homicide, suicide)
15. Sudden accidental death
16. Serious injury, harm, or death you caused to someone else
17. Any other very stressful event or experience

Pre-Intervention PTSD Checklist for DSM-5 (PCL-5)

Now, please rate how much you were bothered by each symptom **in the past month**, on a scale from 0 (not at all) to 4 (quite a bit)

1. Repeated, disturbing, and unwanted memories of the stressful experience?
2. Repeated, disturbing dreams of the stressful experience?
3. Suddenly feeling or acting as if the stressful experience were actually happening again (*as if you were actually back there reliving it*)?
4. Feeling very upset when something reminded you of the stressful experience?
5. Having strong physical reactions when something reminded you of the stressful experience (*for example, heart pounding, trouble breathing, sweating*)?
6. Avoiding memories, thoughts, or feelings related to the stressful experience?
7. Avoiding external reminders of the stressful experience (*for example, people, places, conversations, activities, objects, or situations*)?
8. Trouble remembering important parts of the stressful experience?
9. Having strong negative beliefs about yourself, other people, or the world (*for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous*)?
10. Blaming yourself or someone else for the stressful experience or what happened after it?
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?
12. Loss of interest in activities that you used to enjoy?
13. Feeling distant or cut off from other people?
14. Trouble experiencing positive feelings (*for example, being unable to feel happiness or have loving feelings for people close to you*)?
15. Irritable behavior, angry outbursts, or acting aggressively?
16. Taking too many risks or doing things that could cause you harm?
17. Being “superalert” or watchful or on guard?
18. Feeling jumpy or easily startled?
19. Having difficulty concentrating?
20. Trouble falling or staying asleep?

Demographics Questionnaire

We would like to ask you some questions about yourself. Please answer the following questions as accurately as possible.

1. What gender do you identify with?
 - A. Male
 - B. Female
 - C. Other

2. What race do you identify as?
 - A. White
 - B. Black or African American
 - C. American Indian or Alaska Native
 - D. Asian
 - E. Native Hawaiian or Other Pacific Islander

3. What ethnicity do you identify as?
 - A. Hispanic
 - B. Non-Hispanic

4. What is your age? _____

5. What is the highest year of college you have **completed**?
 - A. None, I am a Freshman
 - B. 1 year (I am a Sophomore)
 - C. 2 years (I am a Junior)
 - D. 3 years (I am a Senior)
 - E. 4+ Years

6. Are you currently receiving psychotherapy services for mental health?
 - A. Yes
 - B. No

7. If no: Have you ever received psychotherapy services for mental health?
 - A. Yes
 - B. No

If “Yes” to either 12 or 13:

What were these services treating? _____

If you recall, did the treatment incorporate mindfulness training and practice? _____

APPENDIX C

DEBRIEFING AFTER THE FIRST SESSION

Thank you for your participation in the first session. We appreciate your time and willingness to take part in this research. This project is examining how a daily guided exercise focused on your body or experiences may impact mental health in young adults. This is one of the first studies to examine this relationship.

The rest of the data collection will be virtually within Qualtrics. If you have any questions or problems about the study throughout the next week, please contact the research staff at lillylabniu@gmail.com.

It is possible that the material you provide may elicit some distressing thoughts, feelings, or memories for you. If you need immediate assistance, please call the 24-hour Crisis Line (815) 758-6655. If you feel like you are distressed and need help, please either visit a psychological or counseling center (see attached Mental Health resources in the surrounding area). Additionally, the National Suicide Prevention Lifeline phone number is: 1-800-273-8255. The National Domestic Violence Hotline is: 1-800-799-SAFE (7233). We encourage you to print the current and next pages in the event that you would like to access these resources at a later time.

Thank you for your participation!

APPENDIX D
MENTAL HEALTH RESOURCES

Campus Services

Counseling & Consultation Services, NIU (STUDENTS ONLY) (The Counseling and Student Development Center - CSDC)

- Phone: 815/753-1206
- Address: Campus Life Building-200
- Fees: None for counseling. Modest testing fees.
- Hours: 8:00 a.m. – 4:30 p.m. Monday-Friday
- Open whenever NIU is open, including breaks.
- After Hours: Assistance after hours available by calling—815/753-1212
- *Description of Services:* This service provides students with short-term, individual and group counseling for a broad range of personal concerns. Career counseling services include interest assessment, workshops, and use of computerized career counseling programs. Educational counseling services include assistance with test anxiety and study skills. Assessments of drug and alcohol abuse are also provided. First appointment scheduled with 3-7 days. (Handicapped Accessible).

Community Counseling Training Center, NIU (formerly The Counseling Laboratory)

- Phone: 815/753-9312
- Address: 416 Graham Hall
- Fees: None for students, faculty, or staff.
- Hours: Call for available counseling hours.
- *Description of Services:* A wide range of services are offered by the counselors including both personal and vocational counseling. In general, the approach used is one that promotes growth and focuses on increasing emotional well-being and self-awareness. All counselors are doctoral or masters level students who are being supervised by members of the counseling faculty. First appointments scheduled within 3-5 days.

The Couple and Family Therapy Clinic of NIU, NIU (formerly The Family Therapy Clinic)

- Phone: 815-753-1684
- Address: Wirtz Hall 146
- Fees: The cost of services are determined by a sliding fee scale. No client is turned away due to the inability to pay. This gives clients of all income levels access to our high-quality care.
- Hours: Monday, Tuesday – 12 noon – 9:00 pm; Wednesday, Thursday - 9:00 am - 9:00pm; Friday - 9:00 am - 5:00 pm
- Website: <http://www.chhs.niu.edu/familytherapyclinic/contact/index.shtml>
- *Description of Services:* The Couple and Family Therapy Clinic at NIU is a training and research facility that is an integral component of the specialization in Marriage and Family Therapy Program (SMFT). They provide clinical services to individuals, couples, and families with a unique perspective of addressing the issues in a larger systemic context. They follow rigorous training standards as set forth by our accrediting organization, being accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE).

Psychological Services Center, NIU

- Phone: 815/753-0591
- Address: Normal Rd and Lincoln Hwy.
- Fees: No fee for therapy for students; fee for assessments for students. Faculty, staff, and community members charged on a sliding scale.
- Hours: Monday – 11:00 a.m. – 7:00 p.m. Tuesday – 12:00 noon – 8:00 p.m. Wednesday-Friday- 9:00 a.m. to 5:00 p.m.
- Open whenever NIU is open, including breaks.
- *Description of Services:* Individual, couples, family, and group psychotherapy, intellectual, personality, and academic assessments. Clients are generally seen by advanced level graduate student staff under faculty supervision. Services are tailored to meet a client's specific needs. First appointment scheduled within 7 days. (Handicapped accessible.)

Community Resources

KishHealth System Behavioral Health Services (formerly Ben Gordon Center)

- Phone: 815/756-4875
- Address: 12 Health Services Dr., DeKalb, IL 60115
- Fees: Sliding fee scales based on income. Insurance accepted.
- Hours: Monday-Thursday- 8:00 a.m. – 8:30 p.m. Friday-8:00 a.m.-5:00 p.m.
- After Hours: 815/758-6655 Crisis Line
- Description of Services: Comprehensive counseling services to all residents of DeKalb County. Services to all persons affected by mental health problems, substance abuse, and family/child welfare concerns. 24-hour sexual assault/abuse services can be accessed through the Crisis Line. First appointment scheduled within 30 days. (Handicapped accessible and on Campus Bus Route).

Braden Counseling Center

- Phone: 815/787-9000
- Address: 2580 DeKalb Ave., Suite C., Sycamore, IL 60178
- 951 S. 7th St., Suite G., Rochelle, IL 60168
- Fees: Sliding fee scales based on income. Insurance accepted.
- Description of Services: Free initial consultation. Specializes in counseling individuals, couples and families in various stages of life. Has flexible scheduling with Sycamore and Rochelle locations. Also offers a variety of evaluations, including same-day DUI evaluations, and legal and forensic work for attorneys.

Village Counseling

- Phone: 815/756-9907
- Address: 1211 Sycamore Rd., DeKalb, IL 60115
- Fees: Sliding fee scales based on income. Insurance accepted.
- Hours: Monday-9:00 a.m.-10:00 p.m., Wednesday/Thursday-9:00 a.m.-9:00 p.m., Friday-10:00 a.m.-10:00 p.m.

- Description of Services: Provides relationship-centered counseling, including life counseling for individuals, couples, families, adolescents, and children, as well as marriage and family counseling.

Family Service Agency, Center for Counseling

- Phone: 815/758-8616
- Address: 14 Health Services Dr.-DeKalb
- Fees: \$75.00 per visit. Insurance accepted, including NIU Student Insurance. Payment plans and scholarship funds available.
- Hours: Monday-Wednesday-9:00 a.m. – 8:00 p.m., Thursday – Friday – 8:00 a.m. – 4:00 p.m. Additional hours available by appointment.
- Description of Services: Individual, couple, group counseling for children, adults, senior citizens, and families. First appointment scheduled within 1-7 days. (Handicapped accessible and on Campus Bus Route).

Living Rite, The Center for Behavioral Medicine.

- Phone: 815-758-8400
- Address: 1958 Aberdeen Court, Suite 2, Sycamore, IL 60178
- Fees: Based on insurance. Self-pay options are available.
- Description of Services: Individual and Group Therapy. Therapy to deal with chronic pain.

Safe Passage, Inc.

- Phone: 815-756-7930
- Hotline/Crisis: 815-756-5228
- Address: P.O. Box 621, DeKalb, IL 60115
- Description of Services: A wide variety of services are offered to victims and perpetrators of domestic and sexual violence including crisis intervention and medical advocacy for victims of domestic and sexual violence, short- and long-term housing for victims and their children, counseling, legal advocacy, children's services, community education, a batterer's intervention program, and a Latina outreach program.

Nationwide Resources

People Against Rape (PAR; 1-800-877-7252)

Rape, Abuse, Incest National Network (RAINN; 1-800-656-4673; <http://www.rainn.org/>)

Suicide Prevention Hotline (1-800-273-8255, <http://www.suicidepreventionlifeline.org/>)

National Alliance on Mental Illness (NAMI; 1-800-950-6264; <http://www.nami.org/>)

APPENDIX E

DEBRIEFING AFTER STUDY COMPLETION

Thank you for your participation. We appreciate your time and willingness to take part in this research. This project is examining how a brief guided self-compassion intervention may impact feelings of loneliness in young adults. Specifically, we are interested in understanding whether a self-compassion intervention can reduce not only the feelings of loneliness but also how one reacts to it. This is one of the first studies to examine this relationship.

It is possible that the material you provided throughout this study may have elicited some distressing thoughts, feelings, or memories for you. If you need immediate assistance, please call the 24-hour Crisis Line (815) 758-6655. If you feel like you are distressed and need help, please either visit a psychological or counseling center (see attached Mental Health resources in the surrounding area). Additionally, the National Suicide Prevention Lifeline phone number is: 1-800-273-8255. The National Domestic Violence Hotline is: 1-800-799-SAFE (7233). We encourage you to print the current and next pages in the event that you would like to access these resources at a later time.

If you would like to meet with a member of the research staff to discuss the study and receive this debriefing in person, please respond to this email and we will set a meeting with you this week.

If you have any questions about the study or what you were asked, please feel free to contact Michelle Lilly at (815) 753-0372 or lillylabniu@gmail.com.

Thank you for your participation!