How Exposure to Personal Distress With and Without Self-Compassion Affects Emotional

Distress Tolerance: Results from a Randomized Controlled Trial Conducted in a Sample of

University Students and a Sample of Community Adults

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Emotional distress tolerance refers to the perceived ability to tolerate one's negative emotions (Simons & Gaher, 2005). Low emotional distress tolerance is a transdiagnostic marker of psychopathology (Leyro et al., 2010) and is therefore important to target in psychological interventions. Cognitive behavioural theories suggest that to overcome low emotional distress tolerance, individuals need to expose themselves to their negative emotions and, in so doing, learn that experiencing negative emotions is more tolerable than they expected. However, when distress intolerant individuals participate in therapy involving such exposures, they find them unbearable (Belleau et al., 2017; Griffen et al., 2018) and terminate treatment early (Daughters et al., 2005; Niles et al., 2017). We theorized that self-compassion, which involves enacting a caring, curious stance toward one's own distress with the intention of preventing and alleviating it (Gilbert, 2014), might make the experience of feeling negative emotions more bearable due to its soothing physiological effects (Kim et al., 2020). We therefore tested the primary hypothesis that, among individuals low in emotional distress tolerance, exposure to negative emotions with self-compassion, as compared to without and a placebo control condition, would lead to superior emotional distress tolerance and that this effect would occur indirectly via greater levels of soothing affect. We also sought to test the secondary hypotheses that exposure with self-compassion compared to without would have higher treatment acceptability and lead to less emotional avoidance over time. To test these hypotheses, we conducted a randomized, single-blind, placebo-controlled, three-arm, parallel-group, additive, superiority trial in a Canadian student sample ($n = 126$) recruited through a mid-sized Canadian university's participant pool and an international community sample ($n = 298$) recruited through the Prolific participant pool, both of which comprised fluent English-speaking adults with below-average levels of emotional

distress tolerance. In an online session, participants were asked to recall a distressing situation and then were randomly assigned through the randomizer function within Qualtrics at a ratio of 1:1:1 to perform one of three written tasks involving: 1) exposure to negative emotions (student sample n = 42, community sample n = 100); 2) exposure to negative emotions with self-compassion (student sample n = 43, community sample n = 98); or 3) a control distraction-based planning condition (student sample n = 41, community sample n = 100). Participants completed questionnaires immediately before and after their written intervention task and again one week later. ANCOVAs revealed that, controlling for baseline emotional distress tolerance levels, condition significantly predicted emotional distress tolerance levels immediately post-intervention, $n^2{}_p$ = .02-.06. The exposure with self-compassion condition yielded higher post emotional distress tolerance than the pure exposure condition in both the student sample (d = 0.52) and community sample (d = 0.37). Further, in both samples, increased soothing affect during the intervention significantly mediated 65-67% of the effect of condition on post-intervention emotional distress tolerance levels. However, ANCOVAs also revealed that, controlling for baseline emotional distress tolerance levels, condition did not significantly predict emotional distress tolerance levels at the one-week follow-up, $n^2{}_p$ = .02-.03. Further, results did not support our hypotheses that the self-compassion condition would result in greater treatment acceptability and emotion engagement. Although not all our hypotheses were supported, results across samples support a focus on helping individuals low in emotional distress tolerance to cultivate self-compassion when experiencing negative emotions. It seems that the soothing affect self-compassion promotes may help these individuals to learn that feeling their distress is more tolerable than they had anticipated. This study is registered with the US Clinical Trials Registry #NCT05284578 and was funded by SSHRC Insight Grant 435-2017-0062.

Table of Contents

List of Figures

List of Tables

Literature Review and Introduction

An Overview of Distress Tolerance

Distress Tolerance Hierarchal Model

Distress tolerance is the ability to tolerate distress (Zvolensky et al., 2010, 2011). As distress can be conceptualized in many ways, many different distress tolerance constructs have developed over-time, each with their own theory and measurement (Zvolensky et al., 2011). To unify the different conceptualizations, Zvolenky et al. (2010) proposed a hierarchal structure, depicted in Figure 1, with the global ability to tolerate distress as the first order and tolerance of five domain-specific dimensions as the second order: uncertainty, ambiguity, frustration, physical discomfort, and negative emotional states. Since the initial proposition, empirical support for this hierarchal structure has emerged through both exploratory and confirmatory factor analyses (Bardeen et al., 2013; Mitchell et al., 2013) as well as network analysis (Evanovich et al., 2019).

Figure 1

Depiction of the Hierarchal Distress Tolerance Model.
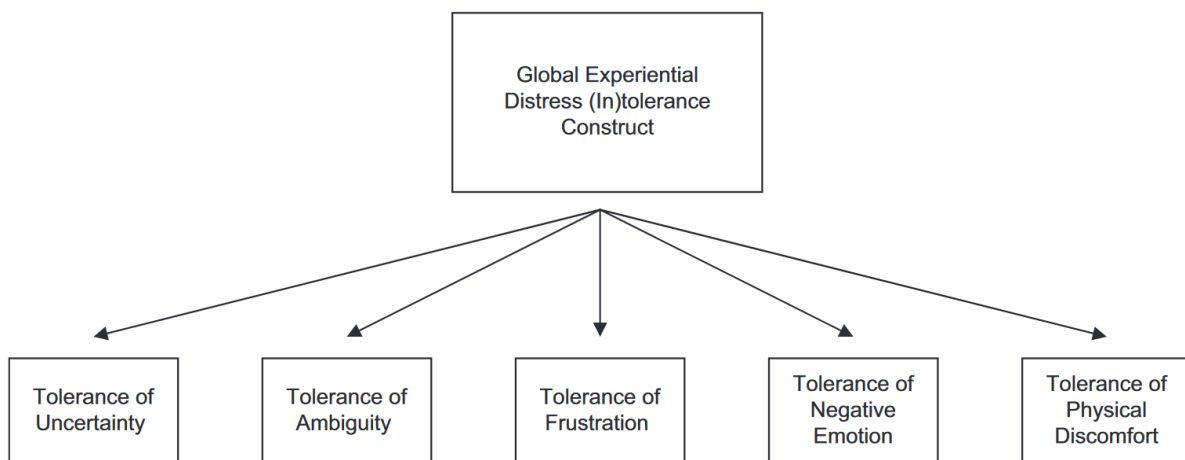
Intolerance of uncertainty refers to maladaptive cognitive, emotional, and behavioural reactions to uncertainty about future situations and events (Freeston et al., 1994). This dimension was originally conceptualized with respect to generalized anxiety disorder (Freeston et al., 1994); however, it has since been identified as a transdiagnostic maintenance factor for anxiety and depressive disorders (McEvoy & Mahoney, 2012). Tolerance of uncertainty is negatively associated with symptoms of generalized anxiety disorder, major depressive disorder, obsessive-compulsive disorder (Gentes & Ruscio, 2011), and social anxiety (Counsell et al., 2017). It is typically assessed through the Intolerance of Uncertainty Scale which is a self-report measure with items such as "Uncertainty makes life intolerable" (Buhr & Dugas, 2002).

Ambiguity tolerance captures how individuals perceive and respond to present situations with insufficient or conflicting information (Durrheim & Foster, 1997). Individuals lower in ambiguity tolerance experience ambiguous situations as distressing and as such try to avoid them (Furnham & Ribchester, 1995). They tend to engage in dichotomous thinking and rapidly categorize information to fit this perspective (Furnham & Marks, 2013). As a result of the frequent inconsistencies in medical recommendations, those lower in ambiguity tolerance experience more distrust of medical professionals and are more likely to avoid medical situations with conflicting information, such as cancer screeners, than those higher in this dimension (Simonovic et al., 2020). Ambiguity tolerance is typically assessed through the Tolerance of Ambiguity Scale which is a self-report measure with items such as "People who insist upon a yes or no answer just don't know how complicated things really are" (Budner, 1962).

Frustration tolerance is the ability to tolerate blocked goal attainment including unexpected lack of reinforcement (Papini et al., 2019) and barriers within goal-directed activities (Yu et al., 2014). This dimension is assessed through both self-report measures, such as the Frustration Discomfort Scale (Harrington, 2005), and behavioural measures, which assess the duration of time individuals persist in tasks designed to induce frustration prior to quitting (Zvolensky et al., 2010). For example, the Computerized Mirror Tracing Persistence Task requires participants to trace the outline of geometric shapes using reverse movements, such as moving the mouse to the right to move the cursor to the left, and the task resets with an irritating sound in response to any deviations from the outline (Strong et al., 2003). Because individuals with lower frustration tolerance quit in the face of obstacles, they tend to have lower academic achievement (Meindl et al., 2019) and frequent occupation changes (Young, 2009). Low frustration tolerance is also associated with externalizing psychological symptoms (Jeronimus et al., 2017), aggressive behaviour (Fives et al., 2011), depression (Korzenev et al., 2012), and attention deficit/hyperactivity disorder (Seymour et al., 2019).

Discomfort intolerance is the lack of capacity to withstand uncomfortable physical sensations and bodily states (Schmidt et al., 2006). This dimension is assessed through both self-report measures, such as the Discomfort Intolerance Scale (Schmidt et al., 2006), and behavioural measures, which assess the duration of time individuals persist in tasks designed to induce physical discomfort prior to quitting (Zvolensky et al., 2010). For example, the Cold Pressor Task has individuals submerge their hands in cold water (approximately 1 ° Celsius) and indicate when this experience becomes uncomfortable (Tousignant-Laflamme et al., 2008). The duration of time between an individual indicating the sensation is uncomfortable and then removing their hands is operationalized as their discomfort intolerance with lower duration

indicating greater intolerance (Tousignant-Laflamme et al., 2008). Individuals high in discomfort intolerance are prone to having concerns about normative physical sensations and as such are at risk of developing panic disorder (Bonn-Miller et al., 2009; Schmidt et al., 2002) as well as seeking medical attention for normative experiences (Schmidt et al., 2006). Discomfort intolerance is also implicated in problematic substance use as a means of coping with physical discomfort (Kosiba et al., 2020) and reduced ability to succeed in substance cessation programs due to increased difficulty with withdrawal symptoms (Brown et al., 2009).

Emotional distress tolerance is the ability to tolerate negative emotional experiences (Simons & Gaher, 2005). Currently, the only measures for emotional distress tolerance are the Distress Tolerance Scale (Simons & Gaher, 2005) and its short form (Garner et al., 2018), which are self-report measures with items such as "Feeling distressed or upset is unbearable to me." The Distress Tolerance Scale has been documented as the most frequently used assessment tool for distress tolerance across all dimensions (McHugh et al., 2011). Low emotional distress tolerance is a transdiagnostic factor of psychopathology (Leyro et al., 2010), and increases in emotional distress tolerance has been identified as a mechanism of change within treatment for a range of disorders including posttraumatic stress disorder (Boffa et al., 2018), anxiety disorders (McHugh et al., 2014), and depressive disorders (Melsom et al., 2022). Within dialectical behaviour therapy, distress tolerance is conceptualized as the ability to tolerate crisis level negative emotions (Linehan, 2014) rather than the ability to tolerate negative emotions of all intensities as conceptualized by Simons and Gaher's (2005). Given that Simons and Gaher's (2005) conceptualization is the most frequently used in distress tolerance literature (McHugh et al., 2011), only literature based on their conceptualization will be referenced throughout. As emotional distress tolerance is the focus of this study, a more thorough review of its

conceptualization and implications is provided in the Emotional Distress Tolerance section below.

Behavioural vs. Self-Report Distress Tolerance

Due to the nature of measurement method, distress tolerance has been conceptualized and operationalized as both 1) the *perceived* ability to tolerate aversive experiences assessed via self-report measures and 2) the *behavioural* ability to tolerate aversive experiences assessed via the duration of time an individual can withstand exposure to a distressing task (Zvolensky et al., 2011). Behavioural and self-reported distress tolerance are often uncorrelated (Ameral et al., 2014; Bernstein et al., 2011; McHugh et al., 2011) and any associations that have been found are weak (Kiselica et al., 2015). Ameral et al. (2014) found that, even when participants' reason for quitting behavioural distress tolerance tasks was to escape the distress, there was still no correlation between self-report and behavioural measures. Evanovich et al. (2019) administered several self-report and behavioural measures of distress tolerance to examine their association within each dimension. Only within the physical discomfort tolerance dimension was the self-report measure (i.e., Discomfort Intolerance Scale) correlated with the behavioural measures (i.e., breath holding task and cold pressor task; Evanovich et al., 2019).

A couple of different explanations have been proposed to explain the lack of correlation between self-report and behavioural measures of distress intolerance. Glassman et al. (2016) proposed that self-report measures capture trait distress tolerance as these require individuals to reflect on all prior examples of their ability to tolerate distress, whereas behavioural measures capture a state measure of distress tolerance as these measure the acute ability to tolerate distress at the time they were administered. Despite this methodological difference, scores on behavioural measures of distress tolerance remain consistent over time, suggesting they are

capturing a stable trait-like construct (Zvolensky et al., 2010). In contrast, McHugh et al. (2011)

explain the lack of correlation between self-report and behavioural measures as a fundamental

difference between participants' perception of their ability to tolerate distress and their actual

ability to do so when faced with an aversive task. Silverman (2020) suggests that behavioural

measures assess "the ability to persist in goal-directed behaviors despite experiencing

psychological distress" (pp. 1-2), which encompasses both experiencing distress as assessed in

self-report measures and the additional ability to persist in goal-directed behaviours while doing

so. In support of this proposition, a new self-report distress tolerance measure, the Distress

Tolerance Questionnaire, was created which assesses goal-oriented persistence through distress

where participants indicate how probable items are for them such as "Accepting frustration as a

necessary obstacle to persist through when trying to achieve a goal" (Rojas, 2017). Although this

measure is hypothesized to capture the global distress tolerance construct, items frequently

reference frustration and only measures of frustration tolerance (i.e., Frustration Tolerance Scale,

mirror-tracing persistence task, and paced auditory serial task) were utilized for construct

validity. Despite this limitation, this new self-report measure is associated with both self-reported

frustration tolerance and the latency to quit across behavioural frustration tolerance tasks (Rojas,

2017). Therefore, within the dimension of frustration tolerance, there is empirical support for the

proposition that self-report and behavioural measures are capturing related, but distinct,

constructs: the ability to tolerate distress and the ability to persist in goal-directed behaviour

while experiencing distress.

Emotional Distress Tolerance

Emotional Distress Tolerance Model

Simons and Gaher (2005) proposed an emotional distress tolerance model whereby the belief that one cannot tolerate negative emotions leads individuals to appraise situations involving negative emotions as threatening, which in turn motivates them to use emotion regulation strategies to avoid and escape experiencing their negative emotions. Although these strategies provide immediate relief from the distress, they increase the intensity of emotions and reinforce the belief that negative emotions are intolerable (Simons & Gaher, 2005). This model may contribute to the understanding of how self-reported and behavioural measures are related but distinct constructs, as they may be capturing different steps within the distress tolerance cycle. The self-report measures capture the perception that distress intolerant individuals hold around being unable to tolerate negative emotions (Zvolensky et al., 2011) which fuels the appraisal of situations involving negative emotions as threatening. As behavioural measures capture the duration of time in which individuals remain in a distress-provoking situation before terminating (Zvolensky et al., 2011), these may be capturing the point at which distress intolerant individuals engage in avoidant or escape coping. Although this model is specific to emotional distress tolerance, the same perception and duration before avoidance may generalize to other dimensions of distress as well. Since their initial proposition, there is now abundant empirical support for this model.

To begin, emotional distress tolerance affects cognitive appraisals of stressors such that lower distress tolerance is associated with greater interpretation of stressful opportunities such as job interviews as threatening rather than as an opportunity for growth and personal gain (Lee et al., 2018). Further, distress intolerant people have specific interpretation biases for distress-

related information, such that lower distress tolerance is associated with more frequent pairing of ambiguous emotion words like "negative emotions" with negative interpretations such as "overwhelming" rather than neutral interpretations (Oglesby et al., 2018). Thus, lower emotional distress tolerance does lead to the appraisal of situations involving negative emotions as threatening.

Coping strategies can be categorized as avoidant coping, which consist of strategies that are directed away from a threat such as distraction or denial, or approach coping, which consist of strategies that are directed toward a threat such as problem solving or seeking support (Skinner et al., 2003). The tendency to appraise stressful situations as threatening, as is common in distress intolerant individuals (Lee et al., 2018), is associated with the use of avoidant coping strategies (Thompson et al., 2014). Low emotional distress tolerance itself is a predictor of the use of avoidant coping strategies (McHugh et al., 2013), including emotion suppression, avoidance, and rumination (Jeffries et al., 2016). It is also associated with non-suicidal self-injury, which distress intolerant individuals use as a strategy to escape aversive affective states (Anestis et al., 2013, 2014). Further, individuals with low emotional distress tolerance have a greater likelihood than those higher on this construct to have problems with substance use due to their tendency to be motivated to use substances as a strategy with which to cope with unpleasant emotional or physical states (Bujarski et al., 2012; Marshall-Berenz et al., 2011; Semcho et al., 2016).

Although the use of avoidant coping strategies provides temporary relief from distressing emotions, these strategies are maladaptive long-term (Skinner et al., 2003). A daily diary study found that the use of avoidant coping strategies predicted greater negative affect the following day (Weiss et al., 2019). In addition, emotion suppression, an avoidant coping strategy defined as

inhibiting negative emotional experiences and expressions, activates the sympathetic nervous system which is associated with a physiological stress response (Hofmann et al., 2009; Reynaud et al., 2012). Thus, counter to intent, the strategies distress intolerant individuals use when faced with distress increase and prolong negative emotions (Ruan et al., 2019) which may reinforce their perceived inability to tolerate negative emotions.

Lastly, in addition to prolonging and increasing the intensity of negative emotions, the use of avoidant coping strategies prevents individuals with low emotional distress tolerance from learning that their negative emotions are in fact tolerable. When an individual avoids a stimulus that they perceive to be threatening, they experience a sense of relief from the feared outcome not occurring, and this avoidance strengthens the fear response to the stimulus in the future (Krypotos et al., 2015). This avoidance also prevents new learning, as it does not allow the individual to learn that the feared outcome would not have occurred had they remained in the situation (Krypotos et al., 2015). Given this effect of avoidance on new learning, the use of avoidant coping strategies prevents distress intolerant individuals from experiencing their negative emotions and learning that doing so is more tolerable than they expected. Consistent with this idea, Vervliet et al. (2017) found that individuals with low distress tolerance experienced a greater sense of relief when their feared outcome did not occur than those higher on this construct and this exaggerated relief predicted increased and more generalized avoidance in the future.

In summary, there is empirical support for Simons and Gaher's (2005) model that distress intolerant individuals appraise situations involving negative emotions as threatening, which in turn motivates them to use avoidant coping strategies. Counter to intent, these avoidant coping

strategies increase the intensity of negative emotions and prevent new learning, reinforcing their belief that negative emotions are intolerable.

Importance of Emotional Distress Tolerance

Low emotional distress tolerance is a transdiagnostic marker of psychopathology (Leyro et al., 2010) associated with greater symptom severity in borderline personality disorder (Reza et al., 2015), eating disorders (Hambrook et al., 2011), body dysmorphic disorder (Matheny, Summers, et al., 2017), depressive disorders (Lass & Winer, 2020), posttraumatic stress disorder (Vujanovic et al., 2022), hoarding disorder (Timpano et al., 2009), social anxiety disorder, generalized anxiety disorder, and obsessive-compulsive disorder (Laposa et al., 2015; Michel et al., 2016). In addition to being related to psychological symptom severity, low emotional distress tolerance is associated with greater social and occupational impairment of anxiety disorders (Michel et al., 2016), substance abuse (Pilatti et al., 2022; Semcho et al., 2016), post-traumatic stress disorder, and depression (Brooks Holliday et al., 2016). It is also associated with non-suicidal self-injury and lifetime suicide attempts (Anestis et al., 2013, 2014).

Moreover, emotional distress tolerance affects treatment outcomes. Distress intolerant individuals have greater symptom severity post-treatment for depression (Williams et al., 2013), anxiety (Katz et al., 2017), and posttraumatic stress disorder (Vujanovic et al., 2022) than those higher on this trait. Low emotional distress tolerance is also associated with poorer treatment adherence (Baird et al., 2016; Oser et al., 2013) and early treatment dropout (Daughters et al., 2005).

Among nonclinical individuals, low emotional distress tolerance is associated with reduced quality of life (Ameral et al., 2014). Distress intolerant individuals tend to engage in risky behaviours such as aggressive driving (Beck et al., 2013) and unprotected sex (Tull &

Gratz, 2013). Low emotional distress tolerance is also associated with interpersonal dysfunction including reduced willingness to forgive others and hostility (Matheny, Smith, et al., 2017). Further, it is associated with reduced executive functioning including lower cognitive flexibility, inhibitory control, and working memory (Andres et al., 2021). Thus, as emotional distress tolerance is both a risk factor for psychopathology and reduced quality of life as well as a moderator of treatment outcomes, the development of interventions for emotional distress tolerance is of prime importance.

Cognitive Behavioural Therapy's Approach to Addressing Maladaptive Beliefs

Theoretical Models

Lovibond's expectancy model proposes that through various forms of learning, including classical conditioning, vicarious learning, and instrumental learning, individuals develop propositional knowledge of what outcomes to expect based on what they observe and experience in relation to a given stimulus (Lovibond, 2006). For example, an individual may have seen a dog – the stimulus – bite someone and now holds the expectation that being close to a dog will result in the outcome of being bitten. When the expected outcome is aversive, individuals engage in avoidance or escape behaviours in the presence of the stimulus to avoid experiencing the aversive outcome (Lovibond, 2006). Although avoidance prevents the feared outcome, it strengthens the fear response to this stimulus in the future and prevents new learning because it does not allow the individual to learn what outcome would have occurred had they remained in the situation (Krypotos et al., 2015).

Cognitive behavioural theorists propose that when individuals perceive an objectively non-threatening stimulus as threatening, they need to gain additional experience with the stimulus so they can learn that it is not as threatening as they had initially believed (Krypotos et

11

al., 2015). Inhibitory learning theory explains that when individuals are exposed to a feared stimulus, they develop new associations with the stimulus that are nonthreatening (Craske et al., 2008). For example, the individual who typically avoids dogs out of a fear of being bitten may learn through exposure that interactions with dogs also result in dogs wagging their tails, smelling objects, and rolling over. Although the association of the stimulus with the feared outcome is not erased, through additional experience with the feared stimulus, the feared outcome is integrated within a range of expected nonthreatening outcomes as well (Craske et al., 2008). This new learning allows the individual to gain a broader range of expectancies which can be classified as excitatory if the outcome elicits fear and inhibitory if the outcome contradicts fear (Jacoby & Abramowitz, 2016). Through this development of a broader range of expectancies, the perceived likelihood or severity of a threatening outcome is reduced, and thus the fear associated with that stimulus is also reduced (Jacoby & Abramowitz, 2016). Although many different theoretical models have been proposed to explain the change in fear that occurs through exposure, inhibitory learning theory currently has the most empirical support, and new work provides recommendations on how to utilize inhibitory theory to maximize clinical outcomes (Bautista & Teng, 2022; Knowles & Olatunji, 2019; Weisman & Rodebaugh, 2018).

Inhibitory Learning Theory's Application to Emotional Distress Tolerance

Although the experience of negative emotions can subjectively feel unpleasant, they are objectively nonthreatening (Parrott, 2014). Negative emotions are a temporary state triggered by life situations that are aversive or have the potential to become aversive; for example, negative emotions may arise upon encountering obstacles in the pursuit of goals, when experiencing bacteria that can make one ill, and when facing the threat of harm to oneself or a loved one (Ekman & Cordaro, 2011). Negative emotions coordinate an individual's physiological and

12

psychological systems, such as attention, learning, and allocation of energy resources, to best prepare them to face the adverse situation (Al-Shawaf et al., 2016). For example, the emotion of disgust encodes information to prevent future encounters with stimuli that have adverse consequences such as making one ill, promotes information gathering to identify the source of the sensory input (e.g., smell) that evoked the disgust, generates facial expressions to communicate the threat to others, and activates inferential biases that favor false positives to ensure one avoids the adverse consequences (Al-Shawaf et al., 2016). Because emotions are designed to prepare one for a temporary situation, they themselves are also temporary (Ekman & Cordaro, 2011). Negative emotions naturally increase in intensity, peak, and then subside (Brans & Verduyn, 2014). Thus, although the experience of negative emotions can subjectively feel unpleasant, they serve many beneficial functions (Parrott, 2014), and the intensity will naturally decline on its own (Brans & Verduyn, 2014).

As previously noted, emotional distress tolerance is the degree to which individuals perceive their negative emotions to be tolerable (Simons & Gaher, 2005), and as such, low emotional distress tolerance is the perception that one's negative emotions are intolerable. Individuals with low emotional distress tolerance perceive negative emotions as a threat (Lee et al., 2018) and avoid experiencing their negative emotions (McHugh et al., 2013); this avoidance then prevents them from learning any new information surrounding the experience of negative emotions (Krypotos et al., 2015). Therefore, emotional distress tolerance is an appropriate target for inhibitory learning because it is a threat-based belief (Lee et al., 2018) around an objectively nonthreatening stimuli – negative emotions (Parrott, 2014) – in which individuals are unable to learn that the stimuli is nonthreatening due to their avoidance of it (Krypotos et al., 2015; Lee et al., 2018). Applying inhibitory learning theory to emotional distress tolerance, cognitive

behavioural theorists would propose that emotional distress tolerance can be increased by exposing distress intolerant individuals to their negative emotions so these individuals can learn that doing so may be less threatening and more tolerable than what they expected.

Behavioural Experiments and Exposures

Cognitive behavioural therapy uses two main approaches to facilitate new learning in clients: behavioural experiments and exposures. Exposures consist of encounters with the feared stimuli (Farmer & Chapman, 2016). These encounters can take many forms including through the client's imagination in imaginal exposure, in real life during in vivo exposure, and through virtual reality technology (Farmer & Chapman, 2016). Regardless of the format, exposures provide the opportunity for individuals to gain new learning about the feared stimulus and its associated outcomes (Farmer & Chapman, 2016). For example, an individual with low emotional distress tolerance may be exposed to their negative emotions by imagining an upsetting situation for long enough to experience the negative emotions it elicits. By experiencing their negative emotions, rather than avoiding them, they may learn that the experience of feeling these emotions is more tolerable than they expected, increasing their emotional distress tolerance. Exposures to feared stimuli are effective at alleviating symptoms from a range of conditions including anxiety disorders (Meyerbröker & Emmelkamp, 2010), obsessive compulsive disorder (Ong et al., 2022), body dissatisfaction (Griffen et al., 2018), phobias (Freitas et al., 2021), and posttraumatic stress disorder (Hendriks et al., 2018).

Behavioural experiments are a technique that encourages the client to take a scientific perspective by undergoing an experiment designed to help them test a thought or belief and gather evidence that supports or contradicts it (Bennett-Levy et al., 2004). Clients first form a prediction of what they expect to occur in a situation; they then experience the situation and

subsequently re-evaluate their belief based on what occurred (Bennett-Levy et al., 2004). For example, an individual with low emotional distress tolerance may form the prediction that experiencing their negative emotions will be completely intolerable. They could then experience their negative emotions by spending a few minutes imagining a situation that would be upsetting to them and if the experience is more tolerable than they had expected, adjust their belief accordingly. Behavioural experiments are effective at reducing psychological symptoms for a range of conditions including posttraumatic stress disorder (Waltman, 2020), social anxiety disorder (Schreiber et al., 2015), and major depressive disorder (Skilbeck et al., 2020).

There are other effective cognitive behavioural therapy techniques for learning new information and testing beliefs, such as automatic thought records where clients generate lists of evidence for and against their beliefs (Josefowitz, 2017). However, clients describe the experiential component of behavioural experiments and exposures as being "felt on a different level" which allows them to process the new information learned on an emotional and intellectual level rather than only an intellectual one (Bennett-Levy, 2003, p. 270). As a result, these approaches are more effective than cognitive behavioural therapy techniques that do not involve an experiential component (McManus et al., 2012). Although originally it was believed that behavioural experiments and exposures functioned through different underlying processes, we now understand that both methods allow individuals to test expectancies as well as broaden their learning both experientially and intellectually about the feared stimuli (McGuire & Storch, 2019).

Current Distress Tolerance Interventions

Many psychotherapy treatment modalities lead to significant improvements in emotional distress tolerance including cognitive behavioural therapy (McHugh et al., 2014), mindfulness-

15

based stress reduction (Nila et al., 2016), dialectical behaviour therapy (Zeifman et al., 2020), and psychodynamic psychotherapy (Melsom et al., 2022). Distress tolerance is frequently investigated as a mechanism of change for symptom improvement (Boffa et al., 2018; Melsom et al., 2022; Zeifman et al., 2020), and as such there is a lack of research on the specific techniques within these treatment modalities and mechanisms of change that are responsible for improvement in emotional distress tolerance itself. To provide further insight on what therapy techniques are effective in improving distress tolerance, a review of specific interventions developed for emotional distress tolerance is provided below.

Substance Cessation Specific Interventions: Exposure and Skills Training

As discussed above, low emotional distress tolerance is associated with substance abuse and the use of substances as a coping strategy to avoid experiencing distress (Bujarski et al., 2012; Marshall-Berenz et al., 2011; Pilatti et al., 2022; Semcho et al., 2016). Due to the physical distress (i.e. withdrawal symptoms) and psychological distress (e.g. withdrawal, interpersonal changes, and previously avoided emotions) involved in substance cessation, low tolerance of physical and psychological distress is an established barrier to long-term substance cessation (Brown et al., 2002, 2009). Given this, initial interventions for distress tolerance were developed to improve substance cessation. These interventions utilize exposure to habituate individuals to the experience of distress and help participants develop adaptive coping skills for emotion regulation to replace substance use (Bornovalova et al., 2012; Brown et al., 2018; Stein et al., 2015).

A fifteen-week distress tolerance intervention for smoking cessation that comprised gradual exposure to withdrawal symptoms and emotion regulation skills training alongside transdermal nicotine patches led to significant improvements in sustained abstinence rates

16

relative to a standard smoking cessation treatment that comprised relapse prevention strategies and transdermal nicotine patches (Brown et al., 2008, 2013). Despite these improvements in smoking cessation, this distress tolerance intervention did not lead to improvements in behavioural measures of frustration tolerance, and its impact on the other dimensions of distress tolerance has not been assessed (Brown et al., 2018). Despite the intervention's design to target distress tolerance, there is currently no empirical support that this intervention improves distress tolerance or that improvements in distress tolerance are responsible for the improvements in smoking cessation.

Similarly, the addition of an intervention targeting distress tolerance to a buprenorphine treatment for opioid cessation had promising results (Stein et al., 2015). The seven-session distress tolerance intervention, which consisted of gradual exposure to the withdrawal symptoms and emotion regulation skills training, led to significantly greater improvements in opioid abstinence than a health education control (Stein et al., 2015). However, since distress tolerance was not assessed, it is unclear if changes in distress tolerance were responsible for the improvements in opioid cessation as hypothesized.

Finally, Skills for Improving Distress Tolerance is an intervention targeting distress tolerance among patients in residential substance use facilities (Bornovalova et al., 2012, 2021). This intervention takes a novel approach to the exposure and emotion regulation skills training method used above, by teaching clients a new emotion regulation skill and then subsequently providing an opportunity for them to practice the new skill within an emotional exposure as described below in the same session (Bornovalova et al., 2012). This approach allows participants to practice new emotion regulation skills with therapist support and reinforces the use of these skills while experiencing emotional distress. Further, in contrast to other distress

tolerance interventions developed for substance cessation (Brown et al., 2018; Stein et al., 2015), the exposures target more general emotional distress via imaginal exposure to current distressing situations in the patient's life, rather than to the specific distress of withdrawal symptoms, which may allow for greater generalization of intervention benefits (Bornovalova et al., 2021). The Skills for Improving Distress Tolerance intervention led to significant pre to post improvements in behavioural measures of frustration tolerance and self-reported emotional distress tolerance; however, only the improvements in frustration tolerance were significantly greater than those in the supportive counselling comparison group (Bornovalova et al., 2012, 2021).

In summary, interventions targeting distress tolerance through exposure and emotion regulation skills training improve current substance cessation programs (Brown et al., 2018; Stein et al., 2015). Despite these improvements, many studies do not measure distress tolerance (Brown et al., 2008, 2013; Stein et al., 2015), and studies that measure distress tolerance tend to focus on frustration tolerance (Bornovalova et al., 2012; Brown et al., 2018). Although these interventions target emotional distress tolerance by teaching emotion regulation skills, it is currently unknown if these techniques lead to improvements in emotional distress tolerance and if improvements in emotional distress tolerance contribute to the improvements in substance cessation.

Transdiagnostic Interventions: Exposure and Psychoeducation

Macatee and Cougle (2015) developed a brief computerized intervention for distress tolerance that combines psychoeducation and imaginal exposure. In the first hour-session, psychoeducation on the adaptive function of negative emotions and consequences of avoidance was delivered via educational videos. This was followed by imaginal exposure to a social rejection situation. During the second hour-session, a review of the psychoeducation delivered in

18

the first session was provided, followed by imaginal exposure to a recent stressful life event. The initial study compared this novel distress tolerance intervention to a waitlist control among individuals with low global distress tolerance. Results indicated that there was no significant effect of the intervention on emotional distress tolerance (measured using the Distress Tolerance Scale) or frustration tolerance (tested via a mirror-tracing persistence task); however, the intervention group had significantly greater reductions in levels of global distress intolerance (based on Distress Intolerance Index scores) than the waitlist control (Macatee & Cougle, 2015). More recently, this study was replicated with an active control intervention, comprised of psychoeducation videos on healthy habits (e.g., sleep hygiene, nutrition, and exercise), within a sample of cannabis users (Macatee et al., 2021). Similar to the initial study, there was no effect of the intervention on frustration tolerance (tested with a mirror-tracing persistence task) and there was a significant increase in global distress tolerance from pre to post; however, the improvements in global distress tolerance were not significantly different from those in the active control condition (Macatee et al., 2021). Thus, psychoeducation and imaginal exposure may be a promising approach for global distress tolerance but may not be effective at reducing emotional distress tolerance.

Transdiagnostic Interventions: Mindfulness

Mindfulness involves bringing awareness and acceptance to moment-by-moment experiences (Bishop, 2004). The awareness component entails directing one's attention to the present moment experience and acknowledging that experience without rumination or suppression (Bishop, 2004). Acceptance consists of approaching one's present moment experience with curiosity, openness, and acceptance rather than judgement (Bishop, 2004). Lotan

et al. (2013) proposed that mindfulness may increase distress tolerance by refocusing attention on the current experience rather than on one's reactions to the distress associated with it.

Mindfulness interventions have shown promising results for the physical discomfort dimension of distress tolerance. Liu et al. (2013) conducted a randomized controlled trial investigating the effects of three 15-minute interventions on cold-pressor task results: mindfulness, distraction, and relaxation control. In the mindfulness condition, participants were introduced to the mindfulness concepts of awareness and acceptance, followed by a 10-minute guided meditation. In the distraction condition, participants were introduced to the strategy of distracting themselves from pain by directing their attention to happy and relaxing images, followed by a 10-minute imagery exercise. Pre to post changes in the cold-pressor task revealed that only the mindfulness condition led to increases in discomfort tolerance based on duration of time participants' hands were emerged in the cold water and decreases in the subjective distress experienced during the cold-pressor task (Liu et al., 2013). Carpenter et al. (2019) also investigated a similar 15-minute mindfulness intervention, comprised of an introduction to mindfulness concepts and guided meditation, on the cold-pressor task and hyperventilation challenge. Authors found that, relative to a relaxation control, the mindfulness intervention led to greater duration in the hyperventilation challenge; however, contrary to Liu et al. (2013), there were no effects of condition on the cold-pressor task or the subjective experience of distress during the distress tolerance tasks. Additional studies on the effects of brief mindfulness interventions on discomfort tolerance have had mixed results, with some researchers finding significant improvements in discomfort tolerance (Lillis et al., 2009) and others no effect (Lotan et al., 2013).

Given the results from research examining the impact of mindfulness practice on discomfort tolerance, a few studies have investigated mindfulness as a potential intervention for emotional distress tolerance. Luberto and McLeish (2018) investigated the effects of a 10-minute guided meditation relative to a control condition on emotional distress tolerance (measured with the Distress Tolerance Scale) and frustration tolerance (assessed using a mirror tracing persistence task). Authors found there was no effect of the mindfulness condition relative to a control on emotional distress tolerance, frustration tolerance, or the subjective experience of distress during the frustration tolerance task (Luberto & McLeish, 2018). In contrast, mindfulness has shown promising results via a hatha yoga intervention. Hatha yoga is a traditional yoga practice that has been described as a "moving meditation" (Iyengar, 1995). Traditional yoga practices induce meditative states through the focus on physical postures, controlled breathing, and gazing points which together induce concentration and reduce external distractions (Jois, 2010). Medina et al. (2015) proposed that hatha yoga would improve emotional distress tolerance through its promotion of mindful awareness and acceptance of one's present experience despite physical or psychological distress. Consistent with this proposition, an eight-week hatha yoga intervention led to significant improvements in emotional distress tolerance relative to a waitlist control (Medina et al., 2015).

In sum, mindfulness interventions may be a promising approach to improving both discomfort tolerance and emotional distress tolerance. However, given the inconsistent findings, further research is needed to clarify when these interventions are beneficial and the underlying mechanisms of change.

Transdiagnostic Interventions: Other Approaches

Although most research on distress tolerance interventions has focused on mindfulness or exposure and emotion regulation skills training, two novel approaches to improving emotional distress tolerance have been recently developed. Silverman (2020) investigated the effects of a brief song writing intervention on emotional distress tolerance facilitated by a music therapist within an acute mental health care unit. Participants collaboratively wrote a song about potential sources of distress after discharge and strategies for how they may tolerate this distress. Post emotional distress tolerance did not differ between the song writing intervention and a music bingo control (Silverman, 2020). Additionally, Wright et al. (2020) investigated the effects of an eight-week distress tolerance intervention that provided psychoeducation on emotions and facilitated the development of emotion regulation skills. There was high attrition with only 61% of participants completing treatment, and only 60.5% of participants who completed the intervention experienced improvements in emotional distress tolerance (Wright et al., 2020). Therefore, emotion regulation skills training and psychoeducation without emotional exposure may only be beneficial for a small subset of individuals.

Cognitive Behavioural Therapy and Emotional Distress Tolerance

As previously noted, inhibitory learning theory explains that when individuals are exposed to a feared stimulus that is not objectively dangerous, they are able to develop new associations with the stimulus that are nonthreatening (Craske et al., 2008). Although the association of the stimulus with the feared outcome is not erased, the development of a broader range of expected outcomes reduces the perceived likelihood or severity of a threatening outcome and thus the fear associated with that stimulus (Jacoby & Abramowitz, 2016). This process of fear of a previously feared stimulus diminishing is referred to as extinction (Shawe-

Taylor & Rigby, 1999). Vervliet et al. (2017) found that extinction was slower in individuals with low emotional distress tolerance which suggests that inhibitory learning is impaired among these individuals. They conditioned a fear to a colored light by repeatedly pairing it with a mild shock to the fingers on their nondominant hand. Despite repeated presentations of the light without a threatening outcome, individuals with low emotional distress tolerance continued to experience more elevated fear at each presentation of the light and more elevated relief when the shock was not delivered than those higher on this trait (Vervliet et al., 2017).

Research on distress tolerance and therapy further supports the idea that exposures are less promising for individuals with low emotional distress tolerance. To begin, these individuals are less likely to perform therapy tasks like exposures that elicit negative emotions (Tull et al., 2013; Williams et al., 2013). When they do participate in therapy that involves exposures, they are more likely to interpret the exposure as intolerable (Belleau et al., 2017; Griffen et al., 2018) and drop out of treatment than those lower on this trait (Daughters et al., 2005; Niles et al., 2017). Lastly, it appears individuals low on emotional distress tolerance benefit less from treatment involving exposures than those high on this trait as evidenced by the greater symptom severity they have at treatment completion across a range of disorders including depression (Williams et al., 2013), anxiety (Katz et al., 2017), and posttraumatic stress disorder (Vujanovic et al., 2022) than those higher on this trait.

Further, the current literature on interventions specifically designed to target emotional distress tolerance fails to show promising results for the effects of exposures on this trait. Of the distress tolerance interventions reviewed above, two different interventions incorporated exposure to negative emotions via imaginal exposure to current distressing life events (Bornovalova et al., 2012, 2021; Macatee & Cougle, 2015). Across these studies, these

interventions did not result in significantly greater pre to post changes in emotional distress tolerance than the control conditions (Bornovalova et al., 2012, 2021; Macatee & Cougle, 2015).

Thus, perhaps simply exposing distress intolerant individuals to their negative emotions may not be effective at increasing emotional distress tolerance because their impaired inhibitory learning (Vervliet et al., 2017) and avoidance of experiences that elicit negative emotions within treatment (Tull et al., 2013; Williams et al., 2013) prevent them from establishing nonthreatening associations with negative emotions. An effective intervention for emotional distress tolerance may therefore require an opportunity for individuals to experience their negative emotions in a way that will promote inhibitory learning to allow them to develop the association of nonthreatening outcomes with negative emotions as well. Self-compassion may be promising in this regard.

Self-Compassion

Origin of Compassion

Rooted in the Buddhist definition, Gilbert defined compassion as having two components: 1) a sensitivity to notice and engage with distress, and 2) a commitment to try and alleviate or prevent distress (Gilbert, 2014). Although there are numerous conceptualizations and definitions of compassion, a review concluded that, across all conceptualizations, compassion consistently included an awareness of suffering as well as a motivation or behaviour to reduce the suffering (Strauss et al., 2016). Thus, Gilbert's definition of compassion comprises the two essential components across conceptualizations. There are three flows of compassion: receiving compassion from someone else, providing compassion to someone else, and self-compassion where the self is both the giver and receiver of compassion (Gilbert, 2009).

24

Compassion is rooted in the caregiving social motivational system which evolved to orient mothers to their infants' distress (Gilbert, 2020). This system was evolutionarily important as it signaled to mothers their infants' distress and the need to take actions to relieve that distress to ensure the infants' needs were met, growth was supported, and genes were passed down (Gilbert, 2019; Preston, 2013). Equally important, the infant evolved a system to respond to their mother's care and feel safe within the distress they were experiencing (Gilbert, 2020). As the ability to both receive and provide compassion formed, mammals evolved physiologically to support these functions (Gilbert, 2014). For example, Polyvagal Theory describes the development of the social engagement system which comprises the brainstem motor systems responsible for both interpreting facial expressions and regulating cardiovascular function (Porges, 2007). By connecting social behaviours and automatic nervous system functioning, this brain system provides a means of receiving compassion because the recognition of caring facial features in others activates the soothing properties of the parasympathetic nervous system (Porges & Furman, 2011).

In addition to caring for offspring, compassion had the evolutionary functions of caring for non-kin, mate selection, and cooperation with non-kin (Goetz et al., 2010). Compassion for non-kin led to providing care for the sick and injured which helped foster more collaborative communities (Gilbert, 2019). In addition, compassionate traits may have helped attract potential reproductive mates because they indicated an increased likelihood of providing resources, physical care, and cooperative communities for offspring (Goetz et al., 2010). Finally, compassion towards non-kin may have been helpful in forming cooperative allyship as this trait indicated trustworthiness and more mutually beneficial relationships (Gilbert, 2020; Goetz et al., 2010). Compassion has many current functions including fostering affiliative relationships,

general social relating and understanding, nurturing personal growth, and providing a sense of safeness (Gilbert, 2019).

Self-Compassion

Consistent with the above conceptualization of compassion, self-compassion involves enacting a caring, curious stance toward one's own distress with the intention of preventing and alleviating it (Gilbert, 2014). To date, most empirical research on self-compassion utilizes Neff's (2003) conceptualization. Neff posited that self-compassion is comprised of three components which influence how individuals respond to distress: self-kindness, common humanity, and mindfulness (Neff, 2003). Self-kindness consists of treating oneself with kindness, support, and understanding rather than being overly self-critical. Common humanity consists of viewing imperfections and hardship as a natural component of being human that unites us with, rather than isolates us from, others. Lastly, mindfulness as conceptualised within the construct of self-compassion is the practice of accepting one's painful thoughts and emotions without avoiding them or over-identifying with them (Neff, 2003). Together these components provide a positive way of relating to the self which promotes resilience in the face of hardship (Neff, 2004) and is associated with both physical and psychological well-being (Hermanto & Zuroff, 2013; Neff et al., 2018)

Self-Compassion and the Automatic Nervous System

The automatic nervous system operates independently of conscious awareness and regulates the function of internal organs (Tindle & Tadi, 2022). It comprises two systems: the sympathetic nervous system and the parasympathetic nervous system (Tindle & Tadi, 2022). The sympathetic nervous system is predominantly involved in physical activity and the stress response (Smith & Vale, 2006). In the presence of a perceived threat, the hypothalamus signals

the adrenal glands to release epinephrine which triggers a series of changes to prepare the body for fight or flight including increased heart rate, respiratory rate, and blood glucose levels to provide extra resources to muscles and organs (Smith & Vale, 2006). Following this initial activation, the hypothalamic-pituitary-adrenal (HPA) axis releases a cascade of hormones that leads to the production of cortisol which regulates the physiological changes and maintains the stress response (Smith & Vale, 2006). In contrast, the parasympathetic nervous system conserves energy and is essential for growth, recovery, and relaxation (Porges, 2007). It downregulates the threat response by reducing cortisol output from the HPA-axis and inhibiting the sympathetic nervous system's fight or flight mechanisms resulting in decreases in heart rate, respiration, and glucose levels (Porges, 2007). It is also involved in many other processes key to resting and recovery such as digestion and immune system functioning (Porges, 2007; Tindle & Tadi, 2022).

There are two types of positive affect. Activating positive affect comprises emotions like joy and excitement (Gilbert et al., 2008). It energizes the body for the completion of tasks and is associated with seeking out and acquiring resources as well as goal attainment (Gilbert, 2014). In contrast, safe/content positive affect provides feelings of being soothed and safe (Gilbert et al., 2008). It calms the body for rest, recovery, and the enjoyment of rewards (Gilbert, 2014). Due to their different functions, safe/content positive affect is associated with greater activation of the parasympathetic nervous system whereas activating positive affect is not (Duarte & Pinto-Gouveia, 2017). Just like when receiving compassion from others, self-compassion activates the parasympathetic nervous system providing feelings of being safe, soothed, and content (Kirby et al., 2017).

Because self-compassion activates the parasympathetic nervous system, it is advantageous when facing stressors. In addition to providing safe/content affect and

downregulating the body, activating the parasympathetic nervous system also increases the capacity to use the prefrontal cortex and engage in higher level thinking that is typically impaired when the threat response is activated by the sympathetic nervous system (Kirby et al., 2017). Controlling for subjective distress, individuals with higher trait self-compassion had less sympathetic nervous system activation during both novel and repeated stressors than those lower on this trait (Breines et al., 2015). State self-compassion during social stressors is also associated with less sympathetic nervous system reactivity, more parasympathetic nervous system activity, and less self-reported anxiety (Arch et al., 2014). These benefits can also be achieved by using exercises that induce state self-compassion, including compassionate self-talk, breathing exercises, and compassionate imagery, which all increase self-reported soothing affect and parasympathetic activity (Kim et al., 2020; Petrocchi et al., 2017). In sum, higher trait, state, and induced self-compassion are all associated with greater parasympathetic nervous system activation.

Due to its activation of the parasympathetic nervous system, self-compassion may enhance the benefits of exposures. Parasympathetic nervous system activity can be indexed by the time interval between heartbeats, where greater heart rate variability indicates greater parasympathetic nervous system activation (Laborde et al., 2017). As such, heart rate variability is often used as an objective marker of parasympathetic nervous system activation. The majority of studies which investigate the association between self-compassion and the parasympathetic nervous system utilize heart rate variability (Kirby et al., 2017). Higher heart rate variability is associated with enhanced ability to inhibit fear responses and accelerates fear extinction (Wendt et al., 2015). Because heart rate variability is such a strong predictor of the rate at which individuals both learn stimuli are safe and their fear response extinguishes, Pappens et al. (2014)

equates heart rate variability with the ease at which inhibitory learning occurs. That is, when individuals have greater heart rate variability, they are better able to form nonthreatening associations with a previously feared – but not objectively threatening – stimulus and reduce their overall perception of the stimulus as threatening based on these newly learned associations. Thus, inducing self-compassion during exposures to feared stimuli may help individuals feel safe and soothed while downregulating the threat response the stimuli evoke; together, these physiological reactions may enhance their ease of inhibitory learning – that is, their ability to learn the stimuli are nonthreatening.

The Potential Value of Self-Compassion for Low Emotional Distress Tolerance

As previously noted, interventions for emotional distress tolerance that utilize emotional exposure are not effective at reducing the perception that negative emotions are intolerable. Due to their impaired inhibitory learning (Vervliet et al., 2017) and avoidance of therapy tasks like exposures that elicit negative emotions (Tull et al., 2013; Williams et al., 2013), individuals with low emotional distress tolerance may not be able to establish nonthreatening associations with negative emotions from emotional exposures. An effective intervention for emotional distress tolerance may require an opportunity for individuals to experience their negative emotions in a way that will promote inhibitory learning to allow them to develop the association of nonthreatening outcomes with negative emotions as well, such as their benefits of motivating behavioural change and providing insight on the situations that elicit them (Parrott, 2014). Self-compassion may be promising in this regard. It activates the parasympathetic nervous system (Kim et al., 2020; Petrocchi et al., 2017) which has soothing physiological effects (Kirby et al., 2017) and downregulates the threat response (Porges, 2007) which together may enhance the ease of inhibitory learning and accelerate fear extinction (Pappens et al., 2014; Wendt et al.,

29

2015). Thus, having distress intolerant individuals experience their emotions through self-compassion may allow them to feel safe and soothed during the experience which would enhance their capacity for inhibitory learning, resulting in the development of nonthreatening associations with negative emotions and subsequent increase in emotional distress tolerance – that is, greater conviction in one's ability to withstand negative emotions. There is empirical support for the positive association between trait self-compassion and trait emotional distress tolerance (Basharpoor et al., 2020; Schoenefeld & Webb, 2013; Webb & Forman, 2013). However, to our knowledge, there are no prior studies that have investigated the effects of self-compassion interventions on emotional distress tolerance.

The Present Study

Study Objectives

Given that low emotional distress tolerance is a transdiagnostic marker of psychopathology (Leyro et al., 2010) associated with poorer treatment outcomes (Katz et al., 2017; Vujanovic et al., 2022; Williams et al., 2013), interpersonal dysfunction (Matheny, Smith, et al., 2017), and reduced quality of life (Ameral et al., 2014), the development of interventions for emotional distress tolerance is of prime importance. The present study aimed to investigate the above proposition that connecting with negative emotions self-compassionately, compared to practices that involve experiencing negative emotions without an explicit compassionate orientation, would result in higher emotional distress tolerance – that is, a greater belief in one's ability to tolerate negative emotions – via access to soothing affect. Further, Simons and Gaher's (2005) model posits that distress intolerant individuals appraise situations involving negative emotions as threatening, which in turn motivates them to use avoidant coping strategies. Should approaching distress with self-compassion be successful in increasing emotional distress

30

tolerance, the less threatening way in which participants come to perceive negative emotions should make them less likely to avoid experiencing their emotions. Thus, our secondary objective was to test if connecting with negative emotions self-compassionately, compared to practices that involve experiencing negative emotions without an explicit compassionate orientation, would result in higher emotion engagement following the intervention. Lastly, given that individuals with low emotional distress tolerance are more likely to avoid therapy tasks like exposures that elicit negative emotions (Tull et al., 2013; Williams et al., 2013) and drop out of treatments that utilize exposures (Daughters et al., 2005; Niles et al., 2017), finding interventions that these individuals find acceptable and are willing to participate in is also of merit. Therefore, we sought to test the relative acceptability of experiencing negative emotions with and without self-compassion.

To investigate these objectives, we conducted a randomized, single-blind, three-arm, parallel-group, superiority trial with 1:1:1 allocation comparing the effects of three conditions on emotional distress tolerance: pure exposure to negative emotions, exposure to negative emotions from a self-compassionate orientation, and a placebo control. Given the need to conduct research online during the COVID-19 pandemic, we utilized written exposure as it is an exposure format that has been shown to be acceptable, tolerable, and well-received when delivered online with limited clinician contact (Roch-Gagné & Talbot, 2019; Sloan et al., 2013). According to both self-report measures and salivary cortisol levels, written exposure elicits similar affective arousal as in vivo exposure (Sloan & Marx, 2006). There is empirical support for its effectiveness with a variety of concerns including generalized anxiety disorder (Goldman et al., 2007; Roch-Gagné & Talbot, 2019), posttraumatic stress disorder (Sloan et al., 2013), and hoarding disorder (Fracalanza et al., 2021). This format of exposure was inspired by expressive

writing which is a well-researched technique known to help people experience and process their negative feelings by exploring their deepest thoughts and emotions surrounding upsetting situations through writing (Frattaroli, 2006; Pennebaker, 1997; Radcliffe et al., 2010). It could therefore allow distress intolerant individuals to test their belief that negative emotions are unbearable and facilitate inhibitory learning. Thus, both the pure exposure and exposure with self-compassion conditions relied on this written exposure format which has been validated online with equal efficacy to in-person formats (Roch-Gagné & Talbot, 2019; Sloan & Marx, 2006). Lastly, to ensure that any effects of the pure exposure to negative emotions and self-compassion conditions were not due to the mere act of writing, we included a control condition that consisted of a neutral writing task unrelated to processing emotions.

According to inhibitory learning theory, the benefits of exposures can be maximized by both having participants clearly identify their feared outcomes as well as facilitating reflection on the outcomes of exposures and how they compare to the feared outcomes (Jacoby & Abramowitz, 2016). As such, to facilitate inhibitory learning, each intervention was imbedded within a behavioural experimental design with open-ended questions before and after the writing tasks to provide this structure. Immediately following their respective intervention, participants completed validated measures of state soothing affect (Gilbert et al., 2008), state distress tolerance (Garner et al., 2018), and intervention acceptability (Tarrier et al., 2006). To explore the duration of intervention benefits and their translation to avoidance, one week later, participants completed measures of trait distress tolerance and emotion engagement that had both been modified to orient them to their experiences over the last week.

Hypotheses

Primary Hypotheses. First, given the above proposed model, we hypothesized that participants in the self-compassion condition would have higher self-reported emotional distress tolerance both immediately following the intervention and at the one-week follow-up, relative to those in the control condition and pure exposure condition. As the pure exposure condition provided the opportunity for inhibitory learning, and the control condition did not, we hypothesized that the pure exposure condition would result in greater emotional distress tolerance both immediately following the intervention and at the one-week follow-up, compared to the control condition.

Next, we sought to test our theoretical model that increased soothing affect during the exposure would result in the greater effectiveness of the self-compassion condition. Thus, we hypothesized that soothing affect levels would mediate the effect of the intervention condition (i.e., pure exposure versus exposure with self-compassion) on emotional distress tolerance. Specifically, we hypothesized that the self-compassion condition would predict higher soothing affect levels than the pure exposure condition, which in turn would predict higher self-reported emotional distress tolerance both immediately following the intervention and at the one-week follow-up.

Secondary Hypotheses. Due to their perception of negative emotions as threatening (Lee et al., 2018; Oglesby et al., 2018), individuals with low emotional distress tolerance tend to avoid experiencing their emotions (McHugh et al., 2013; Thompson et al., 2014). Thus, we predicted that, should the interventions result in greater emotional distress tolerance, the reduced perception of emotions as threatening may lead to less emotional avoidance as well. Given our prediction that the self-compassion condition would have the greatest emotional distress

33

tolerance, we hypothesized this condition would also result in the highest emotion engagement during the week following the intervention. Similarly, as we expected the pure exposure condition to have greater emotional distress tolerance than the control condition, we hypothesized the pure exposure condition would also result in greater emotion engagement than the control condition.

As individuals with low emotional distress tolerance are more likely to avoid therapy tasks like exposures that elicit negative emotions (Tull et al., 2013; Williams et al., 2013) and drop out of treatment that utilizes exposures (Daughters et al., 2005; Niles et al., 2017) than those lower on this trait, we anticipated the pure exposure condition would have low treatment acceptability. Given the potential for participants to experience soothing affect in the self-compassion condition, we hypothesized that the self-compassion condition would have higher treatment acceptability than the pure exposure condition.

Method

We conducted a randomized, single-blind, placebo-controlled, three-arm, parallel-group, superiority trial with 1:1:1 allocation of an intervention for emotional distress tolerance in two samples: a Canadian post-secondary sample and an international adult sample. A parallel-group study was conducted where each participant was assigned to one of three writing-based intervention conditions: pure exposure, exposure with compassion, or a control intervention. The study consisted of two online sessions administered through Qualtrics^{TM}. During the first session, participants: completed pre-intervention measures (Time 1), participated in their assigned intervention, and completed post-intervention measures (Time 2). One week later, participants completed follow-up measures (Time 3) during a second online session. The study was approved by the university Research Ethics Committee and registered with the US Clinical Trials Registry #NCT05284578. As recommended by the 2010 CONSORT statement (Moher et al., 2010), intent-to-treat analyses were used where data from each participant randomly assigned to a condition were included in analyses. Figure 2 and Figure 3 display the flow of participants for the student sample and community sample, respectively.

Participants

Student Sample: Canadian undergraduate students. Undergraduate students ($n =$ 3,297) in a mid-sized Canadian university's psychology participant pool completed the Distress Tolerance Scale (Simons & Gaher, 2005) as a part of a larger pre-screen questionnaire. To ensure participants had sufficiently low emotional distress tolerance to benefit from the interventions, only individuals with emotional distress tolerance scores below the screener mean (3.11 out of 5) were eligible to participate. Baseline emotional distress tolerance scores in the resulting sample ($M = 2.54$, $SD = 0.65$) were significantly lower than nonclinical undergraduate

norms ($M = 3.43$, $SD = 0.76$; Simons & Gaher, 2005), $t(947) = 12.46$, $p < .001$, and not

significantly different from norms in a sample of adults with various anxiety disorders including

generalized anxiety disorder, social anxiety disorder, and panic disorder ($M = 2.46$, $SD = 0.72$;

Laposa et al., 2015), $t(432) = 1.08$, $p = .28$. English fluency was assumed, given all participants

were enrolled at an English university. The study was promoted to eligible students ($n = 1,742$)

through a virtual ad in the participant pool from July 2021 to April 2022, and interested

participants ($n = 126$) self-enrolled.

        Community Sample: International adults. Fluent English speakers aged 18 or over (n

$= 719$) were recruited internationally through the Prolific participant pool to complete the

Distress Tolerance Scale screener from November 2021 to March 2022. To ensure participants

had sufficiently low emotional distress tolerance to benefit from the intervention, only

individuals with emotional distress tolerance below the screener mean (2.93 out of 5) were

eligible to participate. Baseline emotional distress tolerance levels in the resulting sample ($M =$

2.52, $SD = 0.69$) were significantly lower than nonclinical undergraduate norms ($M = 3.43$, $SD =$

0.76; Simons & Gaher, 2005), $t(1119) = 18.14$, $p < .001$, and not significantly different from

norms in a sample of adults with various anxiety disorders including generalized anxiety

disorder, social anxiety disorder, and panic disorder ($M = 2.46$, $SD = 0.72$; Laposa et al., 2015),

$t(604) = 1.04$, $p = .30$. The study was promoted to Prolific users that were eligible based on

screener results ($n = 309$) through an ad on Prolific from November 2021 to March 2022 and

interested participants ($n = 298$) enrolled.

        Although English language fluency was a requirement for participation, 96% of the initial

246 participants indicated a first language other than English. Upon realizing this, we decided to

change our eligibility criteria part-way through data collection and update our trial registration so

that English as one's primary language was required for the last 52 participants. This change was made given the research revealing that processing emotions in one's primary versus secondary language can affect emotional intensity, biological responses (e.g., skin conductance responses), and emotional expression (Caldwell-Harris, 2015). Further, processing emotions in one's secondary language may facilitate greater subjective distance from emotions due to the greater cognitive load of using one's nondominant language and suppressing one's dominant one (Morawetz et al., 2017). By ensuring a significant portion of the sample had English as their primary language, we were able to examine whether patterns of findings differed based on first language reported.

Demographic characteristics for the two samples are presented in Table 1. The student sample was significantly younger and had significantly more participants who identified as female as well as significantly fewer who identified as male than the community sample. Self-identified ethnicity also differed significantly between samples with more participants who identified as East Asian, Middle Eastern, South Asian, and Southeast Asian in the student sample as well as more participants who identified as Black/African and LatinX/Hispanic in the community sample.

Sample Size

We ran an a-priori power analysis using Gpower for an ANCOVA that examined main effects and interactions with three groups, which showed that 82 participants in each group would provide sufficient power (1-β = .80; α = 0.05) to detect a small effect (d = 0.4) at Time 2. Given that past research has found single-session interventions for distress tolerance have small effects on distress tolerance (Luberto & McLeish, 2018), a small effect size was selected. For the student sample, recruitment ended before the desired sample size was reached due to time

37

constraints for the researcher's masters. For the community sample, we initially recruited 246

participants (82 per condition at an allocation of 1:1:1); however, we experienced an attrition rate

of 20% between Time 1 and Time 2. As we had initially planned to do complete-case analysis,

we recruited an additional 52 participants to approach the desired sample size at Time 3.

Randomization

The randomizer function within Qualtrics™ randomized participants to conditions at a

ratio of 1:1:1 within each sample. In the community sample, the researcher changed the

randomizer function to send the last participant of the initial 246 recruited to the pure exposure

condition so that the final number of participants in each condition would end up being equal

(i.e., 82 per condition). However, when an additional 52 participants were recruited, the

researcher forgot to reset the randomizer and as a result 37 participants were sent directly to the

pure exposure condition rather than being randomized. To correct for this error, only data from

the first 17 of these participants were retained for final analyses and 35 additional participants

were randomized to the control or self-compassion condition at a ratio of 1:1, resulting in 18 and

17 more participants in each of these conditions, respectively. This approach allowed us to avoid

an imbalanced and overpowered design.

Measures

Demographics. Participants completed a brief demographics questionnaire during Time

1 to determine age, gender identity, and ethnicity. Participants in the community sample also

provided their country of residence.

Emotional Distress Tolerance

Distress Tolerance Scale (DTS; Simons & Gaher, 2005). This measure consists of 15

items which assess the perceived inability to tolerate negative emotions. A composite distress

tolerance score is computed by taking the mean score across four subscales: Tolerance (3 items, e.g., "I can't handle feeling distressed or upset."); Absorption (3 items, e.g., "My feelings of distress are so intense that they completely take over."); Appraisal (6 items, e.g., "Being distressed or upset is always a major ordeal for me."); and Regulation (3 items, e.g., "I'll do anything to stop feeling distressed or upset."). Levels of agreement with items are answered on a 5-point scale (1 = *Strongly agree* to 5 = *Strongly disagree*) where higher scores indicate greater distress tolerance. Participants completed this measure during the screener, at Time 1, and at Time 3. The Distress Tolerance Scale has good reliability with Cronbach's alpha of .82 in the initial validation study (Simons & Gaher, 2005). In the present study, internal consistency for the composite score ranged between .87-.88 for both samples at Times 1 and 3.

Distress Tolerance Scale-Short Form (DTS-SF; Garner et al., 2018). This four-item measure consists of the top-loading item from each of the four subscales of the Distress Tolerance Scale. It was used to assess distress tolerance immediately after the intervention at Time 2 for brevity and to avoid demand characteristics that may arise from participants responding to the same full measure twice during the same session. A composite score is formed from the mean of the items where higher scores indicate greater distress tolerance. The DTS-SF has been shown to have good internal consistency with Cronbach's alpha of .81 in the initial validation study (Garner et al., 2018). As the DTS-SF items are contained within the DTS, scores for both the full DTS and DTS-SF were calculated when the DTS was administered at Times 1 and 3 to assess their concurrent validity. Pearson correlation coefficients at each time point ranged from .89-.93, all $ps < .001$. In the present study, internal consistency for the DTS-SF composite score was .82 and .70 for the student sample and community sample, respectively.

Emotion Engagement

Compassionate Engagement and Action Scales: Compassion for Self Scale (CEAS-Self; Gilbert et al., 2017). The Engagement subscale of the CEAS-Self consists of 8 items that assess how motivated an individual is to engage with their emotions when they arise. Items such as "I *notice*, and am *sensitive* to my distressed feelings when they arise in me" are rated on a 10-point scale (1 = *Never* to 10 = *Always*). The mean of six items, excluding two filler items, forms the subscale score where higher scores indicate more emotion engagement. Participants completed an unmodified version of this measure at Time 1 and a slightly modified version at Time 3, the latter of which oriented participants to their emotion engagement over the past week specifically. The Engagement subscale of the CEAS-Self has been shown to have acceptable internal consistency with a Cronbach's alpha of .72 in the initial validation study (Gilbert et al., 2017). In the present study, internal consistency was questionable at Time 1 with a Cronbach's alpha of .66 and .65 and acceptable at Time 3 with Cronbach's alpha of .77 and .75 for the student and community samples, respectively.

Affect

Subjective Units of Distress Scale (SUDS). This measure of distress was originally developed by Wolpe (1990); since then, its good construct validity has been established and various adaptions have been developed to measure anxiety or emotional discomfort (Tanner, 2012). In the present study, participants rated the emotional distress they expected to experience during their intervention immediately before completing it and then rated the distress they actually experienced immediately after completing it. Participants used the original 100-point rating scale (0 = *No distress, totally relaxed* to 100 = *Highest distress that you have ever felt*)

when completing the SUDS and were provided with a visual representation of a 'feelings thermometer" modified from Kendall et al. (2005) to visually assist with their ratings.

Soothing affect. Soothing affect was assessed immediately after participants completed their writing activity using a composite of the Serenity subscale of the PANAS-X (Watson & Clark, 1994) and the Safe/Warmth Positive Affect subscale of the Types of Positive Affect Scale (Gilbert et al., 2008). The Safe/Warmth Positive Affect subscale comprises 4 items: "safe," "content," "secure," and "warm." The Serenity subscale comprises 3 items: "calm," "relaxed," and "at ease." Participants rated the degree to which they were currently experiencing each item on a 5-point scale (1 = *Very slightly or not at all* to 5 = *Extremely*). A composite was calculated by taking the mean of all seven items, where higher scores indicated greater soothing affect. In the present study, internal consistency for the composite score was .93 for both samples.

Acceptability

The Endorsement and Discomfort Scale (EDS; Tarrier et al., 2006). This 10-item measure, which assesses the degree to which individuals find an intervention acceptable (i.e., suitable, credible, reasonable, and appropriate), was administered at Time 2 and Time 3. As participants were oriented to think of their intervention as a different approach to their emotions, scale items were modified to replace the term "treatment" with "approach." Agreement with items such as "I think this is a credible approach" was rated on a 9-point scale (1 = *Strongly Disagree* to 9 = *Strongly Agree*). The sum of items forms the total score with higher scores indicating higher acceptability of the intervention. The Endorsement and Discomfort Scale demonstrated good reliability with a Cronbach's alpha of .92 in a study investigating the acceptability of exposure interventions (Levy & Radomsky, 2014). In the present study, internal

41

consistency ranged from .89-.91 and .92-.94 across time points for the student and community samples, respectively.

Credibility/Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000). This 6-item measure compromises two subscales: Credibility (3 items), which assesses perceived credibility of the intervention, and Expectancy (3 items), which assesses participants' expectation for symptom improvement. A modification of item 3 from the Credibility subscale was administered at Time 2 and Time 3. Participants used a 9-point scale (1 = *Not at all confident* to 9 = *Very confident*) to respond to the item "How confident would you be in recommending this approach to a friend who typically approaches unpleasant emotions in the same way you do?" This item will be referred to as the "recommending the intervention question" throughout analyses.

Behavioural Acceptability Measure. A behavioural measure of intervention acceptability was also administered at Time 2 and Time 3. Participants were asked if they would like to receive a copy of the audio recording and instructions for their writing task so they can utilize this approach whenever they would like. To prevent participants from engaging with their writing task throughout the week, which would confound Time 3 responses, instructions were provided after the participant had completed their Time 3 survey or their time to complete Time 3 had elapsed.

Procedure

Time 1. Eligible participants enrolled through their respective online participant pool system in a study advertised as "Why Might we Want to Feel our Feelings?"; study participation was completed online via Qualtrics^{TM}. After providing informed consent, participants completed a demographics questionnaire and then completed the following two measures in a randomized order: the Distress Tolerance Scale, and the Engagement subscale of the Compassion for Self

Scale from the Compassionate Engagement and Action Scales. Then, participants were randomly assigned to one of three conditions: self-compassion condition, pure emotion exposure condition, and control condition.

Overview of Shared Intervention Procedure. Across conditions, the interventions were formatted as a behavioural experiment (Bennett-Levy et al., 2004). First, participants listened to an audio clip which, across conditions, normalized the desire to avoid feeling emotions, explained the benefits of paying attention to emotions, and introduced the writing task as an approach to experiencing emotions for them to try (see Appendix A for scripts of the audio rationales). The end of the audio clip was customized per condition, providing a brief description of what participants would be asked to do and why it may be helpful. Following the audio clip, participants were asked open-ended questions on what they hoped would happen and what they worried might happen during their subsequent writing task; they were also asked to rate the level of distress they anticipated to experience using the Subjective Units of Distress Scale (SUDS).

Next, participants listened to a prompt, based on those used in past research (Clark & Tiggemann, 2007; Imrie & Troop, 2012), telling them to think of a situation that was currently bothering them and elicited feelings of fear, sadness, anxiousness, or distress (See Appendix B for the prompt). As recommended by past research (Fabiansson et al., 2012; Lee & Drummond, 2008), participants were prompted to think of a situation associated with a 60 out of 100 on the SUDS to ensure it elicited sufficient negative affect without causing undue distress. Following this prompt, participants completed their respective writing task. Across conditions, participants were instructed to spend approximately 10 minutes on their writing task.

After their writing task, participants completed the soothing affect measure and rated the level of distress they experienced on the SUDS. Next, participants were presented with their

initial predictions and SUDS responses, and were asked in an open-ended question to reflect on how their experience compared to what they had expected.

Self-Compassion Intervention. When this task was introduced in the initial audio recording, participants were asked to recall a time someone had provided them with compassion, and they were told that their writing activity may allow them to feel their emotions while experiencing a similar level of comfort to what they have experienced from a compassionate other. Writing activity instructions were developed using Paul Gilbert's work including the group compassion-focused therapy manual he is currently developing and the resources from his website. At the beginning of the writing activity, participants were instructed to connect with their 'compassionate self' by recalling a time they had a desire to help someone, and to then connect with the feeling in their body and the orientation in their mind related to the desire to both understand what that person was feeling and alleviate some of their distress. Next, they were prompted to recall the distressing situation they had recalled earlier and to allow themselves to feel the accompanying emotions. Participants were then asked to imagine they were observing themselves in this distressing situation as a "compassionate fly on the wall." They were instructed to observe the emotions they were feeling in the situation and imagine what the vulnerable part of themselves experiencing these emotions may look like. Participants were then asked to write down a description of these emotions from the perspective of a compassionate observer including how they imagined this more vulnerable part of themselves looked, was thinking, and was feeling. After being guided to re-embody their 'compassionate self,' participants read what they had written and wrote a compassionate letter to their 'vulnerable self' from their 'compassionate self.' In their letter, they were instructed to empathize with and validate their suffering as well as express a desire to support and care for themselves. Once they

finished their letter, participants were prompted to read it aloud in a warm and supportive tone. See Appendix C for full condition instructions.

Pure Exposure Intervention. When this task was introduced in the initial audio recording, participants were asked to recall a time they had confided in someone, and they were told that their writing activity may allow them to feel their emotions while experiencing a similar sense of relief. To expose participants to their distressing feelings, we used an expressive writing task, which is a well-researched technique known to help individuals experience negative affect by exploring their deepest thoughts and emotions surrounding upsetting situations through writing (Frattaroli, 2006; Pennebaker, 1997). Writing activity instructions were developed based on instructions used in past research (Imrie & Troop, 2012; Pennebaker, 1997). First, participants were prompted to bring to mind the distressing situation they had recalled earlier and allow themselves to feel the accompanying emotions. Then, they were instructed to write about their deepest thoughts and emotions surrounding their distressing situation, exploring how they felt at the time it occurred and how they felt while writing. Once finished writing, participants were prompted to read aloud what they had written. See Appendix D for full condition instructions.

Control Intervention. To control for demand characteristics and any effects from the mere act of writing, an emotionally neutral writing condition was used. Previous research suggests that writing about daily activities factually and unemotionally is a control writing task with a neutral effect, whereas writing about trivial topics is not a suitable control task as it may unintentionally worsen some outcomes (Radcliffe et al., 2010). Given this research, a time management writing task was created based on similar tasks used in past research (Cohen et al., 2008; Radcliffe et al., 2010). When this task was introduced in the initial audio recording, participants were reminded that, "Sometimes it feels like our emotions are in control of us rather

than us being in control of them." They were asked to recall a time they had planned out their tasks and were told that their writing activity may help to restore their sense of control after having felt their emotions. Participants were instructed to write out their plans for the next 24 hours and the upcoming week while focusing on the facts of their plan and avoiding emotions or opinions about their plans. To mimic the experimental conditions, participants were asked to read aloud what they had written. See Appendix E for full condition instructions.

Time 2. Following their randomized intervention, participants completed the Distress Tolerance Scale-Short Form followed by the three acceptability measures: the Endorsement and Discomfort Scale, item 3 of the Credibility/Expectancy Questionnaire about confidence in recommending the intervention to a friend, and the behavioural measure that involved interest in receiving the writing activity instructions. The first online session, which consisted of Time 1 measures, the intervention, and Time 2 measures, took approximately one hour to complete, and participants were compensated with 1 course credit or 5.82 GBP in the student sample and community sample, respectively.

Time 3. Participants gained access to the second online session through their respective participant pool seven days after completing the first online session and had three days to complete it. After providing informed consent, they completed the following measures: Distress Tolerance Scale, the Engagement subscale of the Compassion for Self Scale from the Compassionate Engagement and Action Scales, and the three acceptability measures. The second session, which consisted of Time 3 measures, took approximately 10 minutes to complete, and participants were compensated with 0.5 course credit or 0.97 GBP in the student sample and community sample, respectively. After completing the second online session, participants were

redirected to a post-study information letter which explained in greater detail the purpose of the study and included resources should they wish to learn more about the topic.

Results

Missing Data

In the student sample, 20.6% of participants ($n = 26$) did not complete the Time 3 survey. Of the participants ($n = 100$) who completed the Time 3 survey, one additional participant (1%) did not complete the Endorsement and Discomfort Scale and the recommending the intervention question. Little MCAR's test showed the data were missing completely at random: $X^2(429) = 311.40$, $p = 1.00$. In the community sample, 0.7% ($n = 2$) of responses were missing from the Endorsement and Discomfort Scale. Further, 20.1% of participants ($n = 60$) did not complete Time 3 and, of the participants who did ($n=238$), an additional four (1.7%) did not complete the Endorsement and Discomfort Scale. Little MCAR's test showed the data were missing completely at random: $X^2(384) = 323.138$, $p = .989$.

To conduct intent-to-treat analyses, multiple imputation was used to impute all missing values. The percentage of data missing in both samples fell within the acceptable 5-40% range to use multiple imputation (Jakobsen et al., 2017). Five imputations were produced through SPSS's automatic multiple imputation method, which automatically selected fully conditional specification imputation or monotone imputation based on a scan of missing value patterns in the data (Heymans & Eekhout, 2019).

Analytic Strategy

We conducted all analyses using IMB SPSS Statistics version 26. All analyses conducted using variables from Time 3 were performed on multiply imputed data. For *t*-tests and multiple regressions, SPSS provided pooled imputation results using Rubin's Rules. When pooled results were not provided, we followed recommendations by Heymans and Eekhout (2019). Specifically, we used the micombine.chisquare function and micombine.f function from the miceadds package to combine imputation results for chi-squares and ANOVAs, respectively.

These functions are based on the formulas provided in Marshall et al. (2009) and Enders (2010). Lastly, for analyses using the PROCESS macro, the analyses were run on each imputation individually and their results were pooled using Rubin's Rules as described by Heymans and Eekhout (2019).

To test hypotheses 1 and 2 that the self-compassion condition would yield the highest emotional distress tolerance and emotion engagement, respectively, we conducted mixed factorial analyses of covariance (ANCOVAs) in which the main independent variable was condition. Dependent variables were Time 2 emotional distress tolerance, Time 3 emotional distress tolerance, and Time 3 emotion engagement; in all models, baseline levels of the relevant dependent variable served as a covariate to control for any trait-level differences between conditions that were not accounted for by random assignment. To test hypothesis 1, we additionally conducted paired-sample *t*-tests within each condition to examine the magnitude of change in emotional distress tolerance from Time 1 to Times 2 and 3.

We planned to compare the acceptability of the self-compassion condition and pure exposure condition as these were the only two conditions that consisted of theoretically plausible interventions for emotional distress tolerance. Four independent sample *t*-tests were conducted comparing these two conditions with the Endorsement and Discomfort Scale and the recommending the intervention question at Times 2 and 3 as dependent variables. For the behavioural acceptability measure, Pearson chi-squares were conducted comparing the proportion of individuals in each condition who indicated interest in receiving their intervention instructions at Times 2 and 3.

Finally, to test the hypothesis that soothing affect would mediate the effect of the self-compassion condition versus the pure exposure condition on emotional distress tolerance, Time 2

49

and Time 3 emotional distress tolerance were investigated individually as outcome variables. The control condition was not included in this model because we were testing the proposition that access to soothing affect during emotion exposure would help participants interpret the experience of negative emotions as bearable. Given participants in the control condition were not engaging with their emotions, access to soothing affect within this condition would not be testing the above proposition. Simple mediation analysis was conducted using Hayes (2018) PROCESS v3.5 macro for SPSS, model 4, with 10,000 percentile bootstrap samples. PROCESS conducts ordinary least square regressions for the mediator and outcome variable from its respective predictor variables. For example, the mediator is predicted by the independent variable and the covariate. A dummy-coded condition variable was created with the pure exposure condition as the reference group. For each post-intervention time point, Time 1 emotional distress tolerance was the covariate to control for any differences in trait-level emotional distress tolerance that were not accounted for by random assignment, the dummy-coded condition variable was the independent variable, soothing affect was the mediator, and emotional distress tolerance at Time 2 or 3 was the dependent variable. Indirect effects and direct effects with 95% bootstrapped confidence intervals are presented for each model. As recommended by Hayes (2018), unstandardized coefficients are reported.

Preliminary Analyses

Data were screened for outliers using the cut-off value of |3.00| standard deviations beyond the mean (Field, 2013). In the student sample, a lower value outlier was identified in the Engagement subscale of the Compassionate Engagement and Action Scale: Compassion for Self at Time 3, and two lower value outliers were identified in item 3 of the Credibility/Expectancy Questionnaire at Time 2. These three outliers were winsorized by replacing them with the next

lowest non-outlying values of the scale to which they belonged (Field, 2013). Skewness and

kurtosis were within acceptable limits for all variables (Field, 2013) at less than |1.12| and |1.30|,

respectively.

In the community sample, lower value outliers were identified in the following scales:

three in the Endorsement and Discomfort Scale at Time 2, five in the recommending the

intervention question at Time 2, three in the Endorsement and Discomfort Scale at Time 3, one

in the recommending the intervention question at Time 3, and one in the Engagement subscale of

the Compassionate Engagement and Action Scale: Compassion for Self at Time 3. An upper

value outlier was identified in the Distress Tolerance Scale at Time 1. These fifteen outliers were

winsorized by replacing them with the next lowest or next highest non-outlying values of the

scale to which they belonged (Field, 2013). Skewness and kurtosis were within acceptable limits

for all variables (Field, 2013) at less than |0.93| and |0.70|, respectively. Descriptive statistics and

bivariate correlations after data cleaning and multiple imputation appear in Table 2 and Table 3,

respectively.

Baseline Differences. To ensure that random assignment prevented baseline condition

differences in emotional distress tolerance and emotion engagement, two sets of ANOVAs were

performed with condition as the independent variable and Time 1 scores on the relevant measure

as the dependent variable. There was no significant effect of condition on Time 1 emotional

distress tolerance in the student sample, $F(2, 123) = 0.25$, $p = .776$, $n^2_p = .00$, or the community

sample, $F(2, 295) = 1.20$, $p = .304$, $n^2_p = .01$. In addition, there was no significant effect of

condition on Time 1 emotion engagement subscale from the CEAS-Self in the student sample,

$F(2, 123) = 0.97$, $p = .384$, $n^2_p = .02$, or the community sample, $F(2, 295) = 2.69$, $p = .070$, $n^2_p =$

.02. Therefore, there were no significant baseline condition differences in these two variables in either sample.

Task Duration. An ANOVA investigated whether the duration of time (i.e., number of minutes) spent on the writing task differed across conditions. Condition was entered as the independent variable and writing task duration as the dependent variable. There was a significant effect of condition on writing task duration in the student sample, $F(2, 123) = 3.75$, $p = .026$, $n^2_p = .06$, and the community sample, $F(2, 295) = 8.31$, $p < .001$, $n^2_p = .05$. In the student sample, participants in the pure exposure condition ($M = 9.12$) spent less time on the writing task than the control condition ($M = 13.19$, $p = .009$, $d = 0.59$), but time spent on the self-compassion condition ($M = 11.96$) did not differ from time spent on the pure exposure condition ($p = .062$, $d = 0.41$) or control condition ($p = .422$, $d = 0.18$). In the community sample, participants in the pure exposure condition ($M = 11.00$) spent less time on the writing task than those in both the self-compassion condition ($M = 14.49$, $p < .001$, $d = 0.45$) and the control condition ($M = 15.38$, $p < .001$, $d = 0.56$). Given these differences between conditions, we examined whether time spent on the writing task correlated with our key outcome variable of emotional distress tolerance to ensure that any effects of condition could not be explained by time spent. Pearson zero-order correlations revealed that time spent was not significantly correlated with emotional distress tolerance at Time 2 ($r = .11$, $p = .234$; $r = .02$, $p = .743$) or Time 3 ($r = .07$, $p = .474$; $r = -.02$, $p = .739$) in the student sample and community sample, respectively. Nevertheless, we conducted analyses controlling for task duration throughout. Given that task duration was not significantly associated with the dependent variables and controlling for it did not change the results, analyses are reported without controlling for task duration.

Question 1: Emotional Distress Tolerance

To test the hypothesis that the self-compassion condition would yield the highest emotional distress tolerance at each time point, outcomes at Times 2 and 3 were investigated individually. In the student sample, an ANCOVA revealed that, controlling for Time 1 emotional distress tolerance, which accounted for variation in Time 2 emotional distress tolerance, $F(1, 122) = 43.42$, $p < .001$, $n^2_p = .26$, there was an effect of condition on Time 2 emotional distress tolerance, $F(2, 122) = 3.90$, $p = .023$, $n^2_p = .06$ (see Figure 4 for a visual depiction of results). Consistent with our hypotheses, pairwise comparisons showed that the self-compassion condition yielded higher Time 2 emotional distress tolerance than the pure exposure condition ($d = 0.52$, $p = .018$) and the control condition ($d = 0.53$, $p = .017$); however, contrary to hypotheses, there were no significant differences between the control and pure exposure conditions ($d = 0.01$, $p = .983$). In the community sample, an ANCOVA revealed that, controlling for Time 1 emotional distress tolerance, which accounted for variation in Time 2 emotional distress tolerance, $F(1, 294) = 110.52$, $p < .001$, $n^2_p = .27$, there was an effect of condition on Time 2 emotional distress tolerance, $F(2, 294) = 3.59$, $p = .029$, $n^2_p = .02$ (See Figure 5 for a visual depiction of results). Consistent with our hypotheses, pairwise comparisons showed that the self-compassion condition yielded higher Time 2 emotional distress tolerance than the pure exposure condition ($d = 0.37$, $p = .010$). Contrary to hypotheses, Time 2 emotional distress tolerance in the control condition was marginally higher than the pure exposure condition ($d = 0.27$, $p = .062$) and was not significantly different from the self-compassion condition ($d = 0.10$, $p = .466$).

In the student sample, an ANCOVA revealed that, controlling for Time 1 emotional distress tolerance, which accounted for variation in Time 3 emotional distress tolerance, $F(1, 122) = 8.78$, $p = .013$, $n^2_p = .17$, there was no effect of condition on Time 3 emotional distress

53

tolerance, $F(2, 122) = 1.61$, $p = .201$, $n^2_p = .03$ (see Figure 6 for a visual depiction of results).

Similarly, in the community sample, controlling for Time 1 emotional distress tolerance, which

accounted for variation in Time 3 emotional distress tolerance, $F(1, 294) = 85.56$, $p < .001$, $n^2_p =$

.42, there was no effect of condition on Time 3 emotional distress tolerance, $F(2, 294) = 2.544$, p

$= .079$, $n^2_p = .02$ (see Figure 7 for a visual depiction of results). Thus, contrary to hypotheses,

there was no effect of condition on Time 3 emotional distress tolerance in either sample.

Next, we used t-tests to examine the magnitude of change in emotional distress tolerance

from Time 1 to Times 2 and 3 within each condition. In the student sample, there were

significant increases in emotional distress tolerance from Time 1 to Time 2 in the self-

compassion condition ($p < .001$, $d = 0.96$) and control condition ($p = .029$, $d = 0.38$), but not in

the pure exposure condition ($p = .108$, $d = 0.34$). In the community sample, there were

significant increases in emotional distress tolerance from Time 1 to Time 2 in the self-

compassion condition ($p < .001$, $d = 0.92$), pure exposure condition ($p < .001$, $d = 0.48$), and

control condition ($p < .001$, $d = 0.73$). When examining changes in emotional distress tolerance

from baseline to follow-up (i.e., Time 1 to Time 3), in the student sample, there were marginal

increases in emotional distress tolerance in the self-compassion condition ($p = .065$, $d = 0.32$), but

not in the pure exposure condition ($p = .859$, $d = 0.04$) or the control condition ($p = .166$, $d =$

0.32). In the community sample, there were significant increases in emotional distress tolerance

in the self-compassion condition ($p < .001$, $d = 0.45$) and pure exposure condition ($p = .022$, $d =$

0.23), but only marginal increases in the control condition ($p = .076$, $d = 0.18$). Full results are

displayed in Tables 4 and 5.

Question 2: Emotion Engagement

To test the hypothesis that the self-compassion condition would yield the highest emotion engagement at Time 3, we conducted a series of ANCOVAs. In the student sample, contrary to hypotheses, controlling for Time 1 emotion engagement, which accounted for variation in Time 3 emotion engagement, $F(1, 123) = 17.47$, $p < .001$, $n^2_p = .13$, there was no effect of condition on Time 3 emotion engagement, $F(2, 123) = 0.57$, $p = .568$, $n^2_p = .01$. Similarly, in the community sample, contrary to hypotheses, controlling for Time 1 emotion engagement, which accounted for variation in Time 3 emotion engagement, $F(1, 295) = 51.88$, $p < .001$, $n^2_p = .20$, there was no effect of condition on Time 3 emotion engagement, $F(2, 295) = 2.04$, $p = .130$, $n^2_p = .01$.

Question 3: Acceptability

To test the hypothesis that the self-compassion condition would yield higher acceptability than the pure exposure condition, a series of independent samples *t*-tests and Pearson chi-squares were performed. Self-reported intervention acceptability was high in both study samples, with mean scores on the Endorsement and Discomfort Scale ranging from 68-71/90 and 65-69/90 in the self-compassion condition and pure exposure condition, respectively. In both samples, independent *t*-tests revealed there were no significant differences in intervention acceptability between the self-compassion and pure exposure conditions on the Endorsement and Discomfort Scale or the recommending the intervention question (see Tables 6 and 7 for means and results). For the behavioural acceptability measure, in the student sample, 30.2% of participants in the self-compassion condition and 16.7% of participants in the pure exposure condition indicated interest in receiving the audio recording at Time 2; in the community sample, 52-53% of the participants in these two conditions indicated interest in receiving the audio recording. In both samples, Pearson chi-squares revealed there was no significant effect of condition at Time 2 or Time 3 on behavioural acceptability (see Table 8 for results). In summary, contrary to

hypotheses, in both samples the self-compassion condition did not yield higher acceptability in self-report or behavioural measures at Time 2 or Time 3.

Question 4: Soothing Affect Mediation

To test the hypothesis that soothing affect would mediate the effect of the pure exposure condition versus the self-compassion condition on emotional distress tolerance, Time 2 and Time 3 emotional distress tolerance were investigated individually as outcome variables. In both the student sample and community sample, there was a significant indirect effect of condition on Time 2 emotional distress tolerance through soothing affect; 65% and 67% of the total effect was mediated, respectively. Specifically, consistent with hypotheses, soothing affect mediated the association between condition and Time 2 emotional distress tolerance such that the self-compassion condition was associated with greater soothing affect, which in turn was associated with greater Time 2 emotional distress tolerance. Regression coefficients, standard errors, and confidence intervals for all pathways are in Table 9.

In both samples, the effect of soothing affect on Time 3 emotional distress tolerance and the indirect effect of condition on Time 3 emotional distress tolerance were significant across all individual imputations; however, when pooled, these effects were no longer significant due to the increased standard error to correct for the variability between imputations. To avoid Type II error, the mediations for Time 3 were also run as complete case analyses where only reported responses were used in place of imputed datasets. Results from the complete case analysis showed a significant indirect effect of condition on Time 3 emotional distress tolerance through soothing affect, with 100% and 56% of the total effect mediated in the student sample and community sample, respectively. Specifically, consistent with hypotheses, soothing affect mediated the associated between condition and Time 3 emotional distress tolerance such that the

self-compassion condition yielded greater soothing affect, which in turn was associated with greater Time 3 emotional distress tolerance. Regression coefficients, standard errors, and confidence intervals for all pathways are in Table 9.

Exploratory Analyses

Given the research revealing that processing emotions in one's primary versus secondary language can affect emotional intensity, biological responses (e.g., skin conductance responses), and emotional expression (Caldwell-Harris, 2015), we conducted an exploratory analysis investigating if the effects of condition on Time 2 emotional distress tolerance differed for participants with English as their primary or secondary language. Given the significantly different gender distribution between samples, we also conducted an exploratory analysis investigating if the effects of condition on Time 2 emotional distress tolerance differed by gender identity. Results indicated that neither language nor gender identity, nor their interactions with condition, significantly predicted Time 2 emotional distress tolerance (see Appendix F for analyses). Therefore, the effects of condition on Time 2 emotional distress tolerance did not differ by gender identity or first language.

According to inhibitory learning theory, the greater the discrepancy between the expected outcome of an interaction with a stimulus and the actual outcome of that interaction, the greater the change in expectations for that stimulus (Jacoby & Abramowitz, 2016). Participants completed the subjective units of distress scale (SUDS) twice; first, after learning about what their writing task would entail but prior to engaging in it, they indicated the intensity of distress they expected to experience, and second, after completing their writing task, they indicated the intensity of distress they actually experienced. First, ANOVAs revealed that there was no effect of condition on expected distress in the community sample, $F(2, 295) = 1.01$, $p = .367$, $n^2_p = .01$,

or the student sample, $F(2, 122) = 2.43$, $p = .092$, $n^2{}_p = .04$. Second, we conducted a series of paired sample t-tests to investigate whether the distress experienced differed from the distress predicted within each condition. In the community sample, participants experienced less distress than predicted in the control condition, $t(99) = 4.25$, $p < .001$, $d = 0.52$; more distress than predicted in the pure exposure condition, $t(99) = 4.31$, $p < .001$, $d = 0.47$; and there was no significant difference between distress predicted and distress experienced in the self-compassion condition, $t(97) = 0.43$, $p = .668$, $d = 0.04$. The same pattern emerged in the student sample at a marginally significantly level: participants experienced marginally less distress than predicted in the control condition, $t(40) = 1.93$, $p = .061$, $d = 0.38$; marginally more distress than predicted in the pure exposure condition, $t(41) = 1.75$, $p = .087$, $d = 0.27$; and there was no significant difference between predicted and experienced distress in the self-compassion condition, $t(42) = 1.51$, $p = .138$, $d = 0.27$. Therefore, in both samples, the distress levels participants predicted they would experience did not differ across conditions; however, in the community sample, participants experienced significantly less distress than expected in the control condition and more than expected in the pure exposure condition.

Discussion

Low emotional distress tolerance, the perceived inability to tolerate one's negative emotions (Simons & Gaher, 2005), underlies many forms of psychopathology (Leyro et al., 2010) and undermines people's ability to participate in (Baird et al., 2016; Daughters et al., 2005; Oser et al., 2013) and benefit from commonly used psychotherapeutic interventions that involve exposure to feared stimuli such as negative emotions (Katz et al., 2017; Vujanovic et al., 2022; Williams et al., 2013). Therefore, the present study sought to uncover new, more effective ways through which to intervene with low emotional distress tolerance. To do so, we integrated theoretical and empirical research on self-compassion with cognitive behavioural models, specifically inhibitory learning theory. We theorized that experiencing negative emotions with self-compassion, as compared to without, would allow individuals to feel safer and more soothed, thereby facilitating the development of nonthreatening associations with negative emotions which should manifest in increased emotional distress tolerance. To test this theory, we investigated the relative effects of three conditions on emotional distress tolerance: a written exposure to negative emotions with self-compassion; a written exposure to negative emotions without an explicit compassionate orientation; and a control condition where participants wrote about an emotionally neutral topic. We tested our hypotheses in two samples of adults with below average levels of emotional distress tolerance which were in the clinical range (Laposa et al., 2015; Simons & Gaher, 2005): a Canadian post-secondary student sample and an international adult sample, the latter of which had participants from 25 countries. In support of our theory, the self-compassion condition resulted in higher emotional distress tolerance than the pure exposure condition via greater levels of soothing affect. However, results did not support our hypotheses that the self-compassion condition would also result in greater treatment

59

acceptability and emotion engagement. Together, findings supported our theory that, by facilitating soothed feelings, interventions that involve experiencing negative emotions with self-compassion may be an effective way to increase emotional distress tolerance among those who are initially low in this trait.

Our primary hypothesis pertained to the likelihood that exposure to negative emotions with self-compassion would be more effective at increasing confidence in one's capacity to withstand distress than exposure to negative emotions without self-compassion. We tested this hypothesis by investigating the relative impact of the interventions on participants' self-reported distress tolerance immediately after they completed their writing task and also one week after the intervention. As hypothesized, in the student sample, the self-compassion condition resulted in higher emotional distress tolerance immediately following the intervention than the pure exposure and control conditions. In the community sample, the self-compassion condition resulted in higher emotional distress tolerance than the pure exposure condition immediately following the intervention only. Further, within-subject effects demonstrated that, in both samples, the self-compassion condition had a large effect on emotional distress tolerance from baseline to immediately following the intervention. Some of these improvements remained for a week, as the self-compassion condition had a medium effect on emotional distress tolerance from baseline to the one-week follow-up in the community sample and a marginally significant small effect in the student sample. Excitingly, these findings support the use of exposure with self-compassion as an effective intervention for emotional distress tolerance. Consistent with prior research (Bornovalova et al., 2012, 2021; Macatee & Cougle, 2015), across both samples the pure exposure condition did not result in greater emotional distress tolerance than the control

condition. These findings further support the idea that simply exposing individuals to their negative emotions may not be sufficient to increase their emotional distress tolerance.

Further in support of our theory was the finding that in both samples the effect of the self-compassion condition on emotional distress tolerance immediately following the intervention was mediated by soothing affect. More specifically, the self-compassion condition was associated with greater soothing affect than the pure exposure condition, and this greater soothing affect was in turn associated with greater emotional distress tolerance immediately following the intervention. These findings support our theory that emotional exposure through self-compassion allowed individuals to feel safe and soothed while experiencing their emotions, presumably helping them to develop nonthreatening associations with negative emotions, resulting in an increased belief in their own capacity to tolerate their distressing feelings. Results further highlight the potential role that insufficient soothing affect during moments of distress may play in perpetuating distress intolerant individuals' negative beliefs about, and aversion to, experiencing negative emotions.

Another interesting finding was the effect of the control condition on emotional distress tolerance within the community sample. In the control condition, participants were instructed to write about their plans for the upcoming day and week in an emotionally neutral and factual manner. Within the community sample, immediately following the intervention, emotional distress tolerance in the control condition did not differ from the self-compassion condition and was marginally higher than the pure exposure condition. Within-subject effects demonstrated that the benefit of the control condition was only temporary with a medium change in emotional distress tolerance from baseline to immediately following the intervention and no significant difference from baseline to the one-week follow-up. One potential explanation for the temporary

change in emotional distress tolerance within the community sample lies within inhibitory learning theory. According to inhibitory learning theory, the greater the discrepancy between the expected outcome of an interaction with a stimulus and the actual outcome of that interaction, the greater the change in expectations for that stimulus (Jacoby & Abramowitz, 2016). In the current study, the stimulus participants were asked to interact with – via writing – was their negative emotions. Findings revealed that there were no differences between conditions in the distress levels participants predicted they would experience during their writing task. Although participants were told they would be engaging with their feelings, participants in the control condition completed a writing task that distracted them from their emotions; as one might expect from this distraction, these participants reported experiencing significantly less distress during their writing task than they had predicted they would. Because participants in the control condition experienced a discrepancy between their prediction and experience such that their experience was significantly less distressing than expected, this discrepancy may have resulted in the temporary increase in their perception of their ability to tolerate negative emotions immediately following the intervention. However, the fact that there was no lasting impact on their emotional distress tolerance one week later suggests that, because they distracted themselves from their emotions, rather than engaging with their emotions, no new learning occurred. Future research should further explore this interpretation.

Our secondary objective was to examine whether exposure to negative emotions with self-compassion, relative to a pure exposure or control condition, would result in higher emotion engagement following the intervention. Due to their perception of negative emotions as threatening (Lee et al., 2018; Oglesby et al., 2018), individuals with low emotional distress tolerance tend to avoid experiencing their negative emotions (McHugh et al., 2013; Thompson et

al., 2014). We thus hypothesized that any increase in emotional distress tolerance following the interventions might therefore lead to less emotional avoidance. As we hypothesized the self-compassion condition would lead to greater emotional distress tolerance than the pure exposure and control condition, we predicted the self-compassion condition would result in greater emotion engagement than these conditions as well. Contrary to hypotheses, in both samples, there were no significant differences between conditions in emotion engagement the week following the intervention. One potential explanation for this is that our interventions consisted of a single exposure session. It is recommended that exposures be repeated in a variety of contexts to maximize inhibitory learning and ease of retrieval of the nonthreatening associations (Craske et al., 2008). Given our sample had comparable emotional distress tolerance levels to clinical norms, the single exposure session within the present study may not have resulted in sufficient changes in the perception of emotions as threatening to impact longstanding patterns of avoidance. Future research should investigate if repeated exposure to negative emotions with self-compassion can lead distress intolerant individuals to engage with their emotions rather than avoid them.

Our final objective was to compare the treatment acceptability of our two theoretically plausible interventions: exposure to negative emotions with self-compassion and pure exposure to negative emotions. To avoid demand characteristics, we did not describe what emotional distress tolerance is, how exposure therapy works, or our hypothesis on why the self-compassion condition would be more effective. Instead, participants were introduced to their intervention as a way to approach their emotions that may be different than what they typically do. To assess treatment acceptability, we had participants complete the Endorsement and Discomfort Scale (Tarrier et al., 2006), which is a standardized self-report measure for treatment acceptability.

When responding to this scale, participants were guided to consider individuals with similar difficulties with negative emotions to them. We also included a behavioural measure of treatment acceptability in which participants were asked if they would like to receive the instructions for their writing task to use in the future. Although we had hypothesized that the self-compassion condition would be considered more acceptable, there were no significant differences in perceived treatment acceptability between the self-compassion and pure exposure conditions on both the self-report and behavioural measures. Given participants were not aware of the true purpose of the interventions or their treatment rationales, the acceptability responses may not reflect true treatment acceptability had they known this information. Future research should replicate this study but instead provide participants with the true purpose and treatment rationale to investigate if, with this information included, there would be differences between conditions on their treatment acceptability and outcomes. In addition, we did not specifically recruit for this study as an intervention for low emotional distress tolerance and as such participants likely had varying interest levels in this type of treatment. Given that participants' interest in seeking treatment may have affected their ratings of treatment acceptability, future research should replicate this study among participants with a desire to increase their emotional distress tolerance to investigate if treatment acceptability results differ among this population.

Interestingly, despite the limitations in how treatment acceptability was assessed, both the self-compassion condition and pure exposure condition yielded high acceptability in both samples. Across samples and timepoints, the mean score on the Endorsement and Discomfort Scale (Tarrier et al., 2006), whose total possible range is between 10-90, varied from 68-71 in the self-compassion condition and 65-69 in the pure exposure condition. Further, approximately half of the participants in the community sample, across both intervention conditions, indicated at the

end of the study that they would like to receive the instructions for their writing task. Because participants had significantly lower emotional distress tolerance than non-clinical populations norms (Simons & Gaher, 2005) and individuals with low emotional distress tolerance tend to avoid experiencing their negative emotions (McHugh et al., 2013; Thompson et al., 2014), the desire to complete a writing task that facilitates emotion engagement in the future is quite noteworthy. Although participants were not fully informed of the treatment purpose and rationale, they still found these interventions acceptable for their difficulties with negative emotions and demonstrated interest in completing them again in the future. These findings suggest that exposure to negative emotions both with and without self-compassion may be acceptable interventions for individuals with low emotional distress tolerance.

Contributions and Implications

To begin, the present study found that, for adults who generally perceive themselves to be unable to withstand negative emotions, exposure to negative emotions with self-compassion resulted in greater emotional distress tolerance than exposure to negative emotions without an explicit self-compassion orientation, and this change occurred through the greater soothing affect they experienced when engaging with their distress compassionately. These findings suggest there may be value in using interventions that foster self-compassion, such as compassion-focused therapy (Gilbert, 2009) or mindfulness meditation (Boellinghaus et al., 2014), when trying to help distress intolerant individuals experiment with feeling their negative emotions. Results further suggest that insufficient access to soothing affect may play a role in perpetuating distress intolerant individuals' negative beliefs about, and aversion to, experiencing negative emotions. Distress intolerant individuals tend to avoid therapy tasks, like exposures, that elicit negative emotions (Tull et al., 2013; Williams et al., 2013); they are more likely to drop out of

psychological treatment (Daughters et al., 2005; Niles et al., 2017); and they benefit less from treatment involving exposures (Katz et al., 2017; Vujanovic et al., 2022; Williams et al., 2013). Therefore, helping these individuals to develop and practice self-compassion may be one way to increase their emotional distress tolerance prior to or in the early stages of treatment; this increased emotional distress tolerance may then increase treatment engagement and positive outcomes.

Our findings also highlight the benefit that self-compassion may offer for inhibitory learning and exposure therapy in general. According to inhibitory learning theory, when individuals are exposed to a feared stimulus that is not objectively dangerous, they develop new associations with the stimulus that are nonthreatening; this is referred to as inhibitory learning because the initial fear response is inhibited through the new associations (Craske et al., 2008). Although the association of the stimulus with the feared outcome is not erased, the development of a broader range of expected outcomes reduces the perceived likelihood or severity of a threatening outcome and thus the fear associated with that stimulus (Jacoby & Abramowitz, 2016). The parasympathetic nervous system provides feelings of being safe and soothed (Kirby et al., 2017) while downregulating the threat response (Porges, 2007) which together may enhance the ease of inhibitory learning and accelerate fear extinction (Pappens et al., 2014; Wendt et al., 2015). Given that practicing self-compassion activates the parasympathetic nervous system (Kim et al., 2020; Petrocchi et al., 2017), inducing self-compassion during exposures may enhance the ease of inhibitory learning. The present study found preliminary support for this theoretical proposition. Although we did not measure parasympathetic nervous system activation or inhibitory learning directly, the self-compassion condition led to higher post-intervention self-reported soothing affect and emotional distress tolerance than the pure exposure condition.

Soothing affect is considered a sign of greater parasympathetic nervous system activation (Duarte & Pinto-Gouveia, 2017; Porges, 2007) and an increase in emotional distress tolerance in the context of the current study likely implies greater inhibitory learning. That is, as distress intolerant individuals came to view their negative emotions as more bearable following the exposure to negative emotions with self-compassion compared to the pure exposure to negative emotions, we might assume that the practice of self-compassion during the exposure helped to form new non-threatening associations with negative emotions that reduced the overall perception of negative emotions as threatening. Future research should more directly investigate if inducing self-compassion enhances the ease of inhibitory learning during exposures to negative emotions as well as other concerns such as phobias. Should the benefits of self-compassion extend to exposures more generally, it may have important theoretical and practical implications for theories about self-compassion and inhibitory learning.

Limitations and Directions for Future Research

There were several limitations in the present study. To begin, both samples had 20% attrition between the first and second session. Although multiple imputation is a well-validated and effective strategy for handling missing data, it does have some limitations (Graham, 2009; Jakobsen et al., 2017). As in any approach for handling missing data, multiply imputed data approximates true scores, but may not reflect them exactly (Jakobsen et al., 2017). Further, due to error both within each imputation as well as between each imputation, analyses using multiply imputed data have reduced power (Graham, 2009). We found significant mediation results for emotional distress tolerance at the one-week-follow up using complete case analysis, but these results were not significant using the imputed data set. Given the reduced power when using multiply imputed data and the potential for biased results from missing data in complete case

67

analysis (Graham, 2009), it is unclear whether soothing affect mediates the effect of the self-compassion condition on emotional distress tolerance at the one-week follow-up. As such, replication with careful attention to reduce loss of data is needed to clarify these findings.

Second, we relied on a self-report measure when assessing soothing affect. It is encouraged to use objective measures when possible to reduce subjectivity in measurement (Bohannon, 1989). Self-compassion is thought to give rise to soothing affect through its activation of the parasympathetic nervous system (Kirby et al., 2017). Further, soothing affect is associated with parasympathetic nervous system activation both experimentally (Duarte & Pinto-Gouveia, 2017) and theoretically through the soothing function of this system (Porges, 2007). As such, parasympathetic nervous system activation may be an appropriate physiological indicator of soothing affect to bolster self-report measures. Thus, future research should replicate this study while also measuring heart rate variability, an objective marker of parasympathetic nervous system activation (Laborde et al., 2017), to further validate this model with an objective marker of soothing affect.

Third, 79.2% of participants in the community sample and 36.5% of participants in the student sample reported a first language other than English. Although all participants were fluent in English, processing emotions in one's primary versus secondary language can affect emotional intensity, biological responses (e.g., skin conductance responses), and emotional expression (Caldwell-Harris, 2015). Further, processing emotions in one's secondary language may facilitate greater subjective distance from emotions due to the greater cognitive load of using one's nondominant language and suppressing one's dominant one (Morawetz et al., 2017). Thus, the first language of participants may have influenced their experience within the study. Exploratory analyses indicated language did not predict emotional distress tolerance or interact

with condition to predict emotional distress tolerance; however, the study should be replicated within a first language English sample and second language English sample to further explore the effects of one's primary language on intervention results.

Fourth, although participants in the pure exposure and self-compassion conditions were instructed to engage with their negative emotions during their writing tasks, because individuals with low emotional distress tolerance tend to avoid experiencing their emotions (Jeffries et al., 2016; McHugh et al., 2013), participants may have engaged in some avoidance during their writing tasks. For example, participants may have written about the situation in a factual matter rather than exploring their emotions regarding that situation. Future research should analyze participants' writing to investigate the level of avoidance that occurred and how this avoidance may have influenced the intervention outcomes. Further due to ethical constraints, participants were instructed to select a situation that elicited moderate levels of negative emotions (i.e., 60 on a scale of 0 to 100) as done in prior research (Fabiansson et al., 2012; Lee & Drummond, 2008). Future research should replicate the study in the presence of a therapist to allow participants to safely engage with a situation that elicits more intense negative emotions providing the opportunity to investigate intervention outcomes and the degree of emotional avoidance at this higher distress level.

Despite these limitations, our results demonstrated that exposure to negative emotions with self-compassion allowed individuals to feel safe and soothed while experiencing their negative emotions, resulting in increased emotional distress tolerance in both a Canadian student sample and international community sample. The present study utilized a nonclinical sample whose mean baseline emotional distress tolerance did not differ from the norms among adults with anxiety disorders (Laposa et al., 2015), suggesting that average emotional distress tolerance

levels were comparable to those of clinical populations. Given that emotional distress tolerance is a transdiagnostic factor of psychopathology (Leyro et al., 2010) associated with greater impairment (Brooks Holliday et al., 2016; Michel et al., 2016) and poorer treatment outcomes (Katz et al., 2017; Vujanovic et al., 2022; Williams et al., 2013), future research should examine the benefits of exposure to negative emotions with self-compassion for clinical populations that are known for their low emotional distress tolerance. For example, low emotional distress tolerance is a maintenance factor in binge eating related disorders (Burr et al., 2021). Due to the marked distress around body image this population experiences, treatment can incorporate mirror exposures which are an established method aimed at alleviating distress surrounding their body image (Klimek et al., 2022). However, a review on mirror exposures noted this treatment can be perceived as intolerable for individuals with low emotional distress tolerance (Griffen et al., 2018). Thus, applying the results of the present study, exposing individuals with binge eating related disorders to their body image distress through mirror exposures with self-compassion, rather than mirror exposures without it, may allow them to feel safe and soothed while experiencing their body image distress, resulting in an increased perception of their ability to tolerate their body image distress and allowing them to benefit from the intervention.

To conclude, the present study found that for individuals with low emotional distress tolerance, exposure to negative emotions with self-compassion resulted in greater emotional distress tolerance than exposure to negative emotions without an explicit self-compassion orientation, and this change occurred through the greater soothing affect they experienced when engaging with their distress compassionately. Our findings support the use of interventions that foster self-compassion when trying to help distress intolerant individuals experiment with feeling their negative emotions and highlight the role that insufficient soothing affect during moments of

70

distress may play in perpetuating distress intolerant individuals' apprehensive beliefs about experiencing their negative emotions.

Figure 2.

Student Sample CONSORT Diagram of Participant Flow
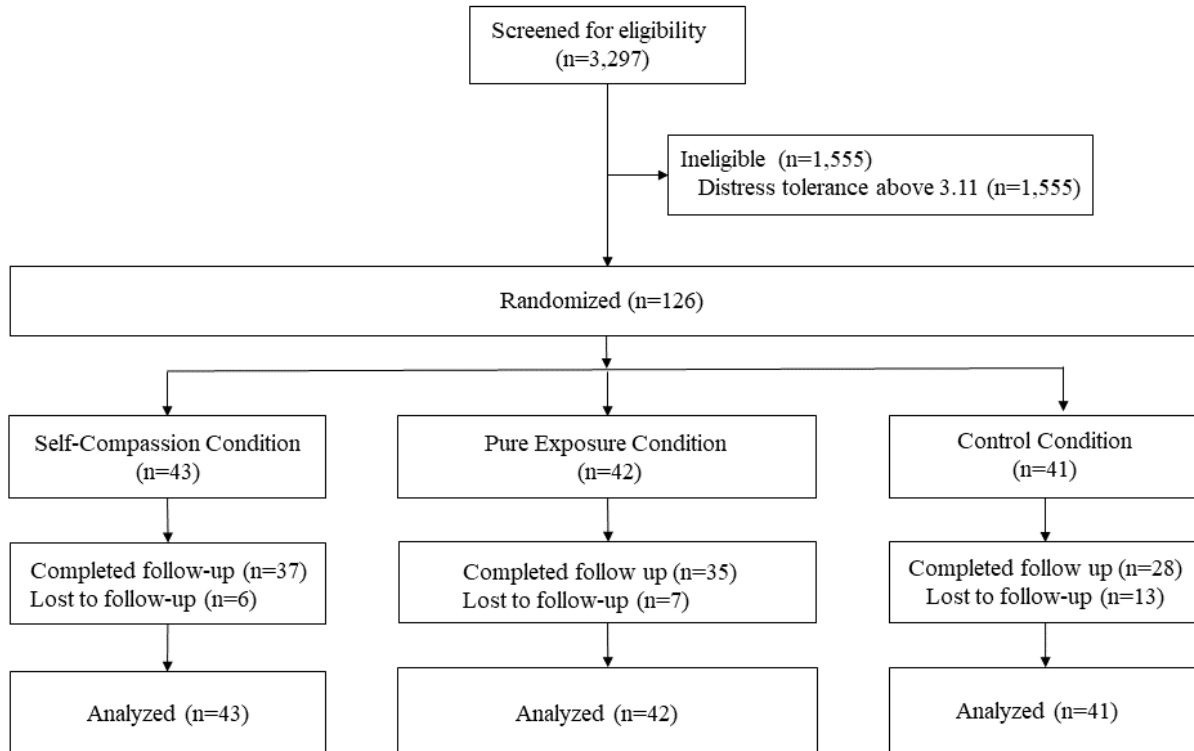
Figure 3.

Community Sample CONSORT Diagram of Participant Flow
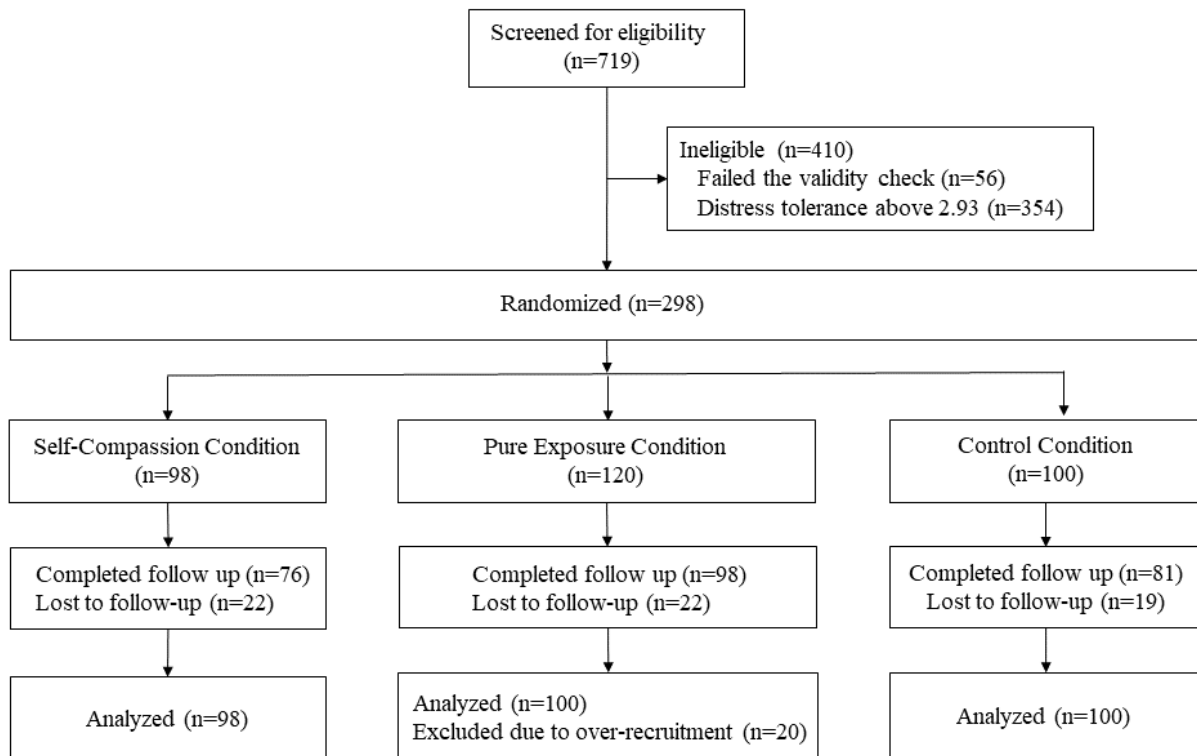
Figure 4.

Mean Time 2 Emotional Distress Tolerance by Condition When Controlling for Baseline

Emotional Distress Tolerance in the Student Sample
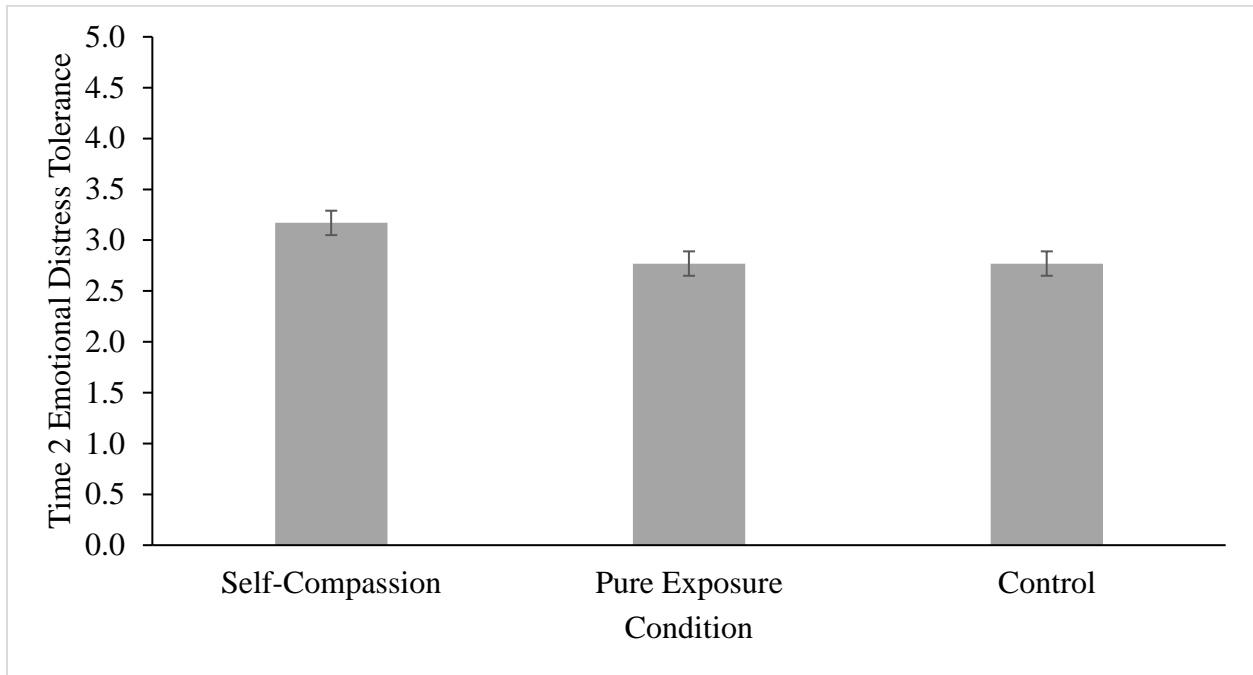
Note. The error bars denote one standard error above and below the mean. The baseline

emotional distress tolerance covariate is evaluated at 2.54.

Figure 5.

Mean Time 2 Emotional Distress Tolerance by Condition When Controlling for Baseline

Emotional Distress Tolerance in the Community Sample
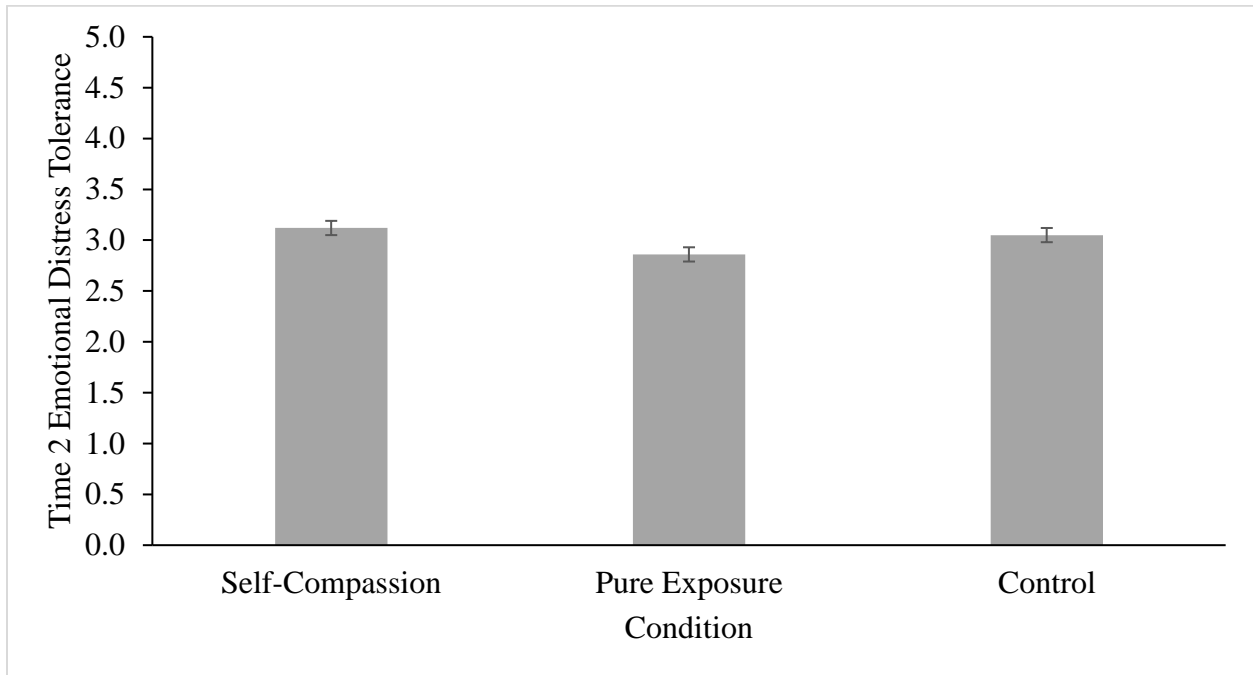
Note. The error bars denote one standard error above and below the mean. The baseline

emotional distress tolerance covariate is evaluated at 2.54.

Figure 6.

Mean Time 3 Emotional Distress Tolerance by Condition When Controlling for Baseline

Emotional Distress Tolerance in the Student Sample
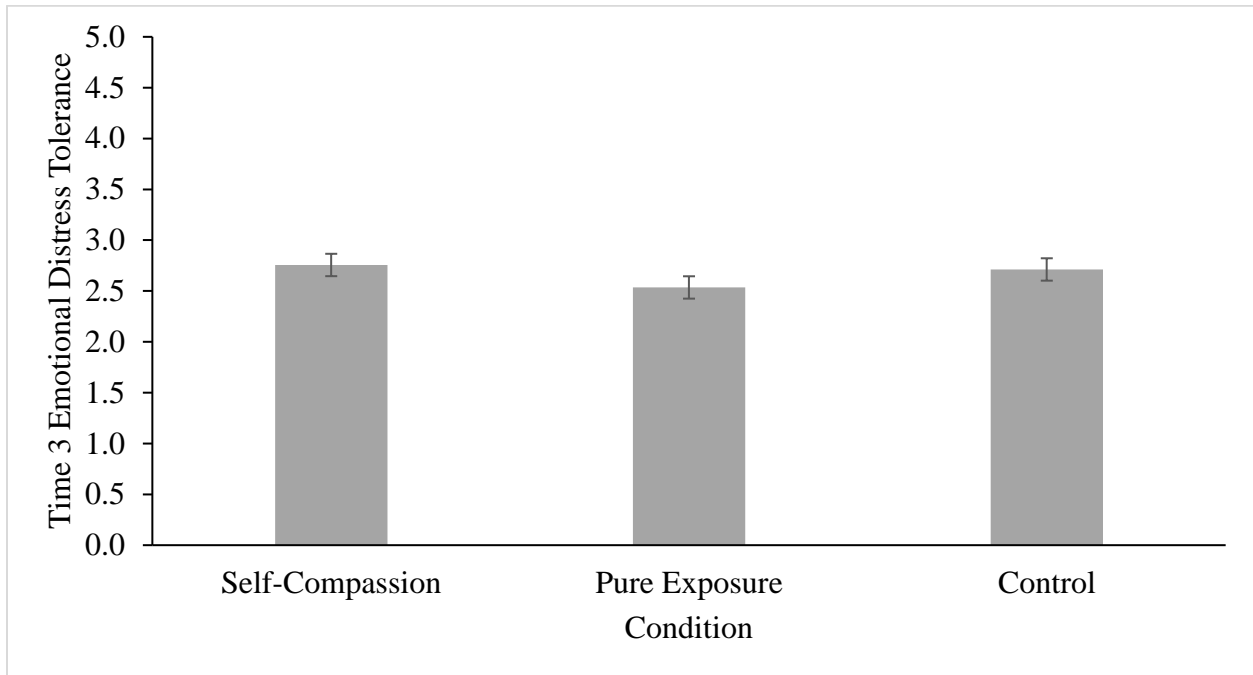
Note. The error bars denote one standard error above and below the mean. The baseline

emotional distress tolerance covariate is evaluated at 2.54.

Figure 7.

Mean Time 3 Emotional Distress Tolerance by Condition When Controlling for Baseline

Emotional Distress Tolerance in the Community Sample
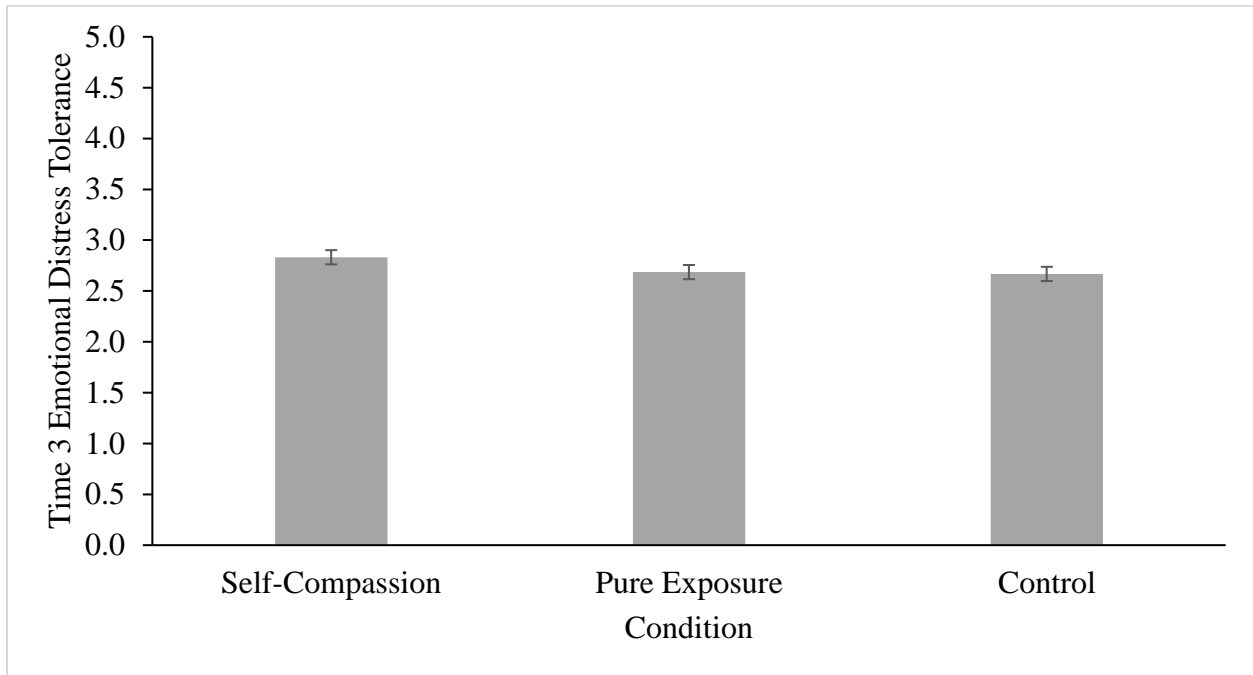
Note. The error bars denote one standard error above and below the mean. The baseline

emotional distress tolerance covariate is evaluated at 2.54.

Table 1.

Demographics by Sample (Mean or Percentage)

	Student Sample (*n* = 126)	Community Sample (*n* = 298)	Statistics
Age in years	19.1(1.5)	25.3(7.3)	*t*(424) = 9.44, *p* < .001
Ethnicity			χ^2(11, *N* = 424) = 153.02, *p* < .001
Black/African	3.2%	21.1%	*p* < .001
East Asian	15.9%	1.0%	*p* < .001
Latino/Hispanic	0.8%	18.1%	*p* < .001
Indigenous	0.8%	0.0%	p = .297
Middle Eastern	6.3%	0.3%	*p* < .001
South Asian	19.0%	1.0%	*p* < .001
Southeast Asian	4.0%	0.3%	*p* = .010
West Indian/Caribbean	0.8%	0.3%	p = .507
White/Caucasian	38.9%	47.3%	χ^2(1, *N* = 424) = 2.54, *p* = .111
Mixed	6.3%	8.7%	χ^2(1, *N* = 424) = 0.68, *p* = .410
Other	2.4%	1.7%	p = .700
Prefer not to disclose	1.6%	0.0%	p = .088
Gender identity			χ^2(3, N = 424) = 51.43, *p* < .001
Female (cis/trans)	89.7%	55.7%	χ^2(1, *N* = 424) = 45.43, *p* < .001
Male (cis/trans)	6.3%	41.6%	χ^2(1, *N* = 424) = 51.36, *p* < .001
Genderqueer	3.2%	2.0%	p = .492
Prefer not to disclose	0.8%	0.7%	p = 1.00
Country of Residence			
South Africa		23.5%	
Portugal		16.4%	
Mexico		18.4%	
Poland		8.5%	
Canada		5.4%	
Spain		4.1%	
Italy		2.7%	
Chile		2.4%	
Greece		2.4%	
Hungary		2.0%	
United Kingdom		2.0%	
United States		1.7%	
Other		10.4%	
Primary Language			
English	63.5%	20.8%	χ^2(1, *N* = 424) = 72.44, *p* < .001
Arabic	1.6%	0.3%	p = .212
Cantonese	1.6%	0.3%	p = .212
French	3.2%	0.3%	p = .029
Greek	0.0%	2.3%	p = .110
Hindu/Urdu	5.6%	0.0%	*p* < .001

Hungarian	0.0%	1.7%	*p* = .328
Italian	0.8%	2.3%	*p* = .445
IsiXhosa	0.0%	1.7%	*p* = .330
Korean	2.4%	0.0%	***p* = .026**
Mandarin	4.0%	0.0%	***p* = .002**
Punjabi	4.8%	0.0%	***p* < .001**
Polish	0.0%	8.1%	***p* < .001**
Portuguese	0.0%	17.8%	***p* < .001**
Sepedi	0.0%	1.7%	*p* = .328
Sesotho	0.0%	2.3%	*p* = .110
Setswana	0.0%	2.3%	*p* = .110
Spanish	0.8%	25.2%	***p* < .001**
Tshivenda	0.0%	1.7%	*p* = .328
Other	11.7%	12.1%	$\chi^2(1, N = 424) = 0.00$, *p* = .959

Note. Significant statistics are bolded. Due to the minimum expected cell frequency for chi-squares (Field, 2013), for comparisons with less than five participants per category Fisher's exact test p-values are reported. As all participants in the student sample were attending a Canadian university at the time of participation, Canadian country of residence was assumed. As such, information on country of residence was only collected for the community sample. Due to the vast number of primary languages reported, languages reported by less than 1% of participants in both samples were aggregated to 'Other'.

Table 2

Means and Standard Deviations of Study Variables

Measure	Student Sample				Community Sample			
	Control	Pure Exposure	Self-Compassion	Full Sample	Control	Pure Exposure	Self-Compassion	Full Sample
				Time 1 (Pre-Manipulation)				
CEAS-E	35.51(6.94)	37.62(6.12)	35.84(8.98)	36.33(7.46)	36.65(6.67)	37.32(8.24)	34.86(8.15)	36.29(7.76)
DTS	2.48(0.56)	2.57(0.78)	2.56(0.61)	2.54(0.65)	2.58(0.72)	2.54(0.69)	2.44(0.65)	2.52(0.69)
				Time 2 (Post-Manipulation)				
DTS-SF	2.73(0.0.73)	2.80(1.03)	3.19(0.89)	2.91(0.91)	3.09(0.76)	2.88(0.83)	3.07(0.87)	3.01(0.83)
Soothing	3.09(0.70)	2.36(1.03)	3.22(1.05)	2.89(1.01)	3.29(0.93)	2.52(1.10)	3.34(0.89)	3.05(1.04)
CEQ Item 3	6.05(1.82)	6.33(1.62)	6.88(1.53)	6.43(1.68)	6.83(1.96)	6.99(1.92)	7.06(1.89)	6.96(1.92)
EDS	65.00(15.26)	66.45(12.41)	68.28(13.30)	66.60(13.65)	70.55(14.21)	69.26(14.13)	71.36(12.15)	70.38(13.52)
				Time 3 (One-Week Follow-Up)				
DTS	2.69(0.66)	2.55(0.63)	2.76(0.70)	2.67(0.67)	2.71(0.69)	2.70(0.73)	2.77(0.74)	2.73(0.72)
CEAS-E	37.89(5.68)	37.65(8.49)	36.33(7.63)	37.28(7.35)	39.01(7.92)	37.43(8.94)	38.06(9.09)	38.17(8.66)
CEQ Item 3	6.57(1.60)	6.47(1.59)	6.44(2.04)	6.49(1.75)	7.15(1.54)	6.84(1.91)	6.94(1.83)	6.98(1.76)
EDS	66.20(10.12)	64.51(12.44)	68.95(13.03)	66.58(12.00)	71.19(13.45)	68.73(15.88)	69.79(14.20)	69.90(14.54)

Note. Standard deviations are presented in parentheses. CEAS-E = Compassionate Engagement and Action Scale: Engagement Subscale of the Self-Compassion Subscale; DTS = Distress Tolerance Scale; DTS-SF = Distress Tolerance Scale-Short Form; Soothing = Composite of PANAS-X: Serenity Subscale and Types of Positive Affect Scale: Safe/Warmth Positive Affect Subscale; CEQ Item 3 = Item 3 of the Credibility/Expectancy Scale; EDS = Endorsement and Discomfort Scale.

Table 3

Intercorrelations for Study Variables Disaggregated by Sample

Measure	1	2	3	4	5	6	7	8	9	10
1. Time 1 CEAS-E	-	.20*	.07	.15	.14	.22*	.13	.36**	.02	.13
2. Time 1 DTS	.10	-	.51**	.33**	.06	.13	.40**	.14	.10	.22*
3. Time 2 DTS-SF	.11	.56**	-	.45**	.28**	.41**	.46**	.21*	.24**	.39**
4. Time 2 Soothing	.33**	.14*	.38**	-	.34**	.48**	.35**	.19*	.26**	.40**
5. Time 2 CEQ Item 3	.29**	.02	.31**	.43**	-	.73**	.11	.16	.61**	.48**
6. Time 2 EDS	.36**	.02	.31**	.52**	.77**	-	.20	.28**	.55**	.69**
7. Time 3 DTS	.09	.64**	.48**	.26**	.09	.13*	-	.20*	.14	.33**
8. Time 3 CEAS-E	.44**	.03	.15*	.34**	.38**	.42**	.15*	-	.23**	.39**
9. Time 3 CEQ Item 3	.27**	-.01	.17**	.37**	.73**	.67**	.06	.38**	-	.65**
10. Time 3 EDS	.29**	.07	.28**	.42**	.66**	.75**	.13*	.44**	.75**	-

Note. The results for the student sample (*n* = 126) are shown above the diagonal. The results for community sample (*n* = 298) are shown below the diagonal. CEAS-E = Compassionate Engagement and Action Scale: Engagement Subscale of the Self-Compassion Subscale; DTS = Distress Tolerance Scale; DTS-SF = Distress Tolerance Scale-Short Form; Soothing = Composite of PANAS-X: Serenity Subscale and Types of Positive Affect Scale: Safe/Warmth Positive Affect Subscale; CEQ Item 3 = Item 3 of the Credibility/Expectancy Scale; EDS = Endorsement and Discomfort Scale.
*p < .05, **p < .01

Table 4

Paired Sample t-Tests Comparing Emotional Distress Tolerance at Time 1 and Time 2

Condition	Time 1		Time 2		*t*	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Student Sample							
Self-Compassion	2.56	0.61	3.19	0.89	5.19	<.001	0.96
Pure Exposure	2.57	0.78	2.80	0.16	1.65	.108	0.34
Control	2.48	0.56	2.73	0.73	2.27	.029	0.38
Community Sample							
Self-Compassion	2.44	0.65	3.07	0.87	7.65	<.001	0.92
Pure Exposure	2.54	0.69	2.88	0.83	4.31	<.001	0.48
Control	2.58	0.72	3.09	0.76	7.77	<.001	0.73

Note. Cohen's *d* was calculated using the mean baseline standard deviation for each sample.

Table 5

Paired Sample t-Tests Comparing Emotional Distress Tolerance at Time 1 and Time 3

Condition	Time 1		Time 3		*t*	*p*	Cohen's *d*
	M	*SD*	M	*SD*			
Student Sample							
Self-Compassion	2.56	0.61	2.76	0.70	1.87	.065	0.32
Pure Exposure	2.57	0.78	2.55	0.63	0.18	.859	0.04
Control	2.48	0.56	2.69	0.66	1.42	.166	0.32
Community Sample							
Self-Compassion	2.56	0.61	2.77	0.74	5.21	<.001	0.45
Pure Exposure	2.57	0.78	2.70	0.73	2.34	.022	0.23
Control	2.48	0.56	2.71	0.69	1.81	0.76	0.18

Note. Cohen's *d* was calculated using the mean baseline standard deviation for each sample.

Table 6

Results Comparing Acceptability Between the Intervention Conditions in the Student Sample

Measure	Self-Compassion		Pure Exposure		*t*	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Time 2 (Post-Manipulation)							
EDS	68.28	13.30	66.45	12.41	0.65	.513	0.14
CEQ Item 3	6.88	1.53	6.33	1.62	1.61	.107	0.34
Time 3 (One Week Follow-Up)							
EDS	68.95	13.03	64.51	12.45	1.60	.110	0.35
CEQ Item 3	6.44	2.04	6.47	1.59	0.07	.942	0.02

Table 7

Results Comparing Acceptability Between the Intervention Conditions in the Community Sample

Measure	Self-Compassion		Pure Exposure		*t*	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Time 2 (Post-Manipulation)							
EDS	71.36	12.51	69.26	14.13	1.11	.264	0.16
CEQ Item 3	7.06	1.89	6.99	1.92	0.26	.793	0.04
Time 3 (One Week Follow-Up)							
EDS	69.79	14.20	68.73	15.88	0.41	.636	0.07
CEQ Item 3	6.94	1.83	6.84	1.91	0.35	.724	0.05

Table 8

Results Comparing Proportion of Participants who Indicated Interest in Receiving their Activity Instructions Between the Intervention Conditions

Measure	Self-Compassion		Pure Exposure		$\chi^2(1)$	*p*
	n	*%*	*n*	*%*		
Student Sample						
Time 2	13	30.2	7	16.7	2.17	.140
Time 3	9.6	22.3	6.8	16.2	0.15	.861
Community Sample						
Time 2	52	53	52	52	0.02	.881
Time 3	41.2	42	38	38	0.03	.973

Note: In the community sample, there were 98 participants in the self-compassion condition and 100 in the pure exposure condition. In the community sample, there were 43 participants in the self-compassion condition and 42 participants in the pure exposure condition. The number of participants for Time 3 consists of a decimal number because it is the mean of the imputations.

Table 9

Path Estimates and 99% Confidence Intervals for the Mediation of the Effect of Condition on Emotional Distress Tolerance through Soothing Affect

Sample	Effect of C on M B(SE)	p	Effect of IV on M B(SE)	p	Effect of M on DV B(SE)	p	Total Effect of IV on DV B(SE)	p	Direct Effect of IV on DV B(SE)	p	Indirect Effect B(SE)	Indirect Effect Lower Limit	Upper Limit
					Time 2 (Post-Manipulation) Original Data								
Student	**0.62(0.15)**	<.001	**0.86(0.21)**	<.001	**0.30(0.09)**	.002	**0.40 (0.18)**	.026	0.14(0.18)	.429	**0.26(0.10)**	0.086	0.488
Community	**0.26(0.11)**	.016	**0.85(0.14)**	<.001	**0.21(0.05)**	<.001	**0.27(0.11)**	.017	0.08(0.11)	.481	**0.18(0.06)**	0.080	0.299
					Time 3 (One Week Follow-Up) Imputed Data								
Student	**0.62(0.15)**	<.001	**0.86(0.21)**	<.001	0.16(0.26)	.546	0.22(0.36)	.546	0.08(0.38)	.824	0.14(0.26)	-0.373	0.646
Community	**0.26(0.11)**	.016	**0.85(0.14)**	<.001	0.15(0.20)	.466	0.15(0.28)	.600	0.03(0.29)	.930	0.12(0.21)	-0.288	0.535
					Time 3 (One Week Follow-Up) Original Data								
Student	**0.63(0.17)**	<.001	**1.0(0.23)**	<.001	**0.19(0.06)**	.002	0.19(0.12)	.130	-0.01(0.13)	.951	**0.19(0.08)**	0.062	0.365
Community	**0.27(0.12)**	.023	**0.76(0.16)**	<.001	**0.12(0.04)**	.002	**0.16(0.08)**	.049	0.06(0.08)	.434	**0.09(0.04)**	0.025	0.183

Note. Estimates of indirect effect are based on 10,000 bootstrapped sample estimates. Upper and lower limits of the direct and indirect effect are based on 95% confidence intervals (CIs). Significant paths, as indicated by 95% CIs that do not include 0, are boldface. C = Covariate (i.e., Time 1 emotional distress tolerance); M = Mediator (i.e., soothing affect); IV = independent variable (i.e., pure exposure versus self-compassion condition); and DV = Dependent Variable (i.e., Time 2 or Time 3 emotional distress tolerance).

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Appendix A: Intervention Rationales

All participants listened to the shared rationale followed by their condition specific rationale.

Shared Rationale

Sometimes feeling our unpleasant emotions can seem overwhelming and unbearable. It's often tempting to try to avoid feeling emotions like sadness and fear by pushing them away or by distracting ourselves with things like schoolwork, Netflix, and social media. You may have heard the expression "bottling up your emotions." While it's understandable to want to avoid feeling unpleasant emotions, avoiding our emotions can lead them to grow in intensity and to ultimately erupt in a way that makes them feel scarier and harder to tolerate.

Past research has found that paying attention to our emotions when they arise, rather than trying to avoid them, can help us to calm, understand, and work through these emotions before they get too intense. Indeed, our emotions evolved to tell us important things about what is going on in our lives and can motivate us to do things that will help us feel better. For example, feeling our loneliness can help us realize that we miss being connected to others and motivate us to reach out to family or friends. Therefore, feeling our emotions, even the unpleasant ones, can have benefits for both our mental and physical health.

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Take a moment to think about what you usually do when you start to feel a negative emotion and how your approach is working for you.

Usually, there are pros and cons to the way we manage our feelings and so it can be helpful to experiment with new ways to deal with our emotions to see how we find these different approaches. Today, we are going to ask you to try to experience your emotions in a way

that might be different from what you normally do. It can be interesting to notice how this new approach feels, see what happens to the intensity of your emotions, and consider whether this approach is something you might want to try again.

Please continue to the next page, where we will explain the approach that we will be asking you to try out today.

Self-Compassion Rationale

First, we will prompt you to think of a recent upsetting experience and pay attention to the unpleasant emotions it brings up for you. Next, we will ask you to write about your emotions from a caring and compassionate perspective. We will prompt you to think back to a time where you felt compassion for someone else and had a desire to be helpful to them. Then, we will ask you to direct this compassion towards yourself by acknowledging the distressing feelings you have been experiencing and offering yourself support and encouragement. You may recall a time someone supported you in this way, and how comforted you felt in response.

You may find that writing a letter to yourself about your upsetting experience and unpleasant emotions from this compassionate perspective helps you understand and work through your emotions while having a similar comforting effect. Of course, it is also possible that you may not experience these benefits. Regardless, we encourage you to be open to and curious about what it is like to approach your feelings in this new way. After you complete the writing task, we will ask you to reflect on this experience and how it felt for you.

Expressive Writing Rationale

First, we will prompt you to think of a recent upsetting experience and pay attention to the unpleasant emotions it brings up for you. Then, we will ask you to write about your thoughts and emotions surrounding this upsetting experience in as much detail as possible. Writing about

114

these emotions in detail may help you understand and work through them before they become more intense and seem too overwhelming to feel. You may recall a time you told someone about an unpleasant experience you were going through and the sense of relief you experienced from talking about it.

You may find that recalling an upsetting experience and subsequently writing about your upsetting experience and unpleasant emotions helps you understand and work through your emotions while providing a similar sense of relief. Of course, it is also possible that you may not experience these benefits. Regardless, we encourage you to be open to and curious about what it is like to approach your feelings in this new way. After you complete the writing task, we will ask you to reflect on this experience and how it felt for you.

Control Rationale

First, we will prompt you to think of a recent upsetting experience and pay attention to the unpleasant emotions it brings up for you. Then, we will ask you to write about your plans for the upcoming day and upcoming week. Sometimes it feels like our emotions are in control of us rather than us being in control of them. So, you may find it helpful to engage in an activity that helps restore your sense of control after you feel these unpleasant emotions. If you think about the last time you planned out your tasks, you may recall the empowering feeling this had.

You may find that recalling an upsetting experience and subsequently writing about your upcoming plans helps provide that sense of control. Of course, it is also possible that you may not experience these benefits. Regardless, we encourage you to be open to and curious about what it is like to approach your feelings in this new way. After you complete the writing task, we will ask you to reflect on this experience and how it felt for you.

Appendix B: Situation Recall Prompt

Think of a situation that is currently bothering you which brings up feelings of fear, sadness, anxiousness, or distress. This can be something that has happened to you, something that you have done, or something that you have been thinking about more often than usual. Please choose a situation where the intensity of the emotions falls about a 60 on the scale below. To ensure you feel safe during this exercise, please do not choose anything related to trauma (e.g., abuse, rape, where someone was in physical danger/harm).

100	Highest distress that you have ever felt.
90	Extremely distressed.
80	Very distressed; can't concentrare. Physiological signs present.
70	Quite distressed; interfering with functioning. Physiological signs may be present.
60	Moderate-to-strong distress.
50	Moderate distress; uncomfortable, but can continue to function.
40	Mild-to-moderate distress.
30	Mild distress; no interference with functioning.
20	Minimal distress.
10	Alert and awake; concentrating well.
0	No distress; totally relaxed.

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If you have not yet, please choose the situation now. You can use the back arrow to review the instructions for selecting the situation. Once you have selected the situation, take a moment to pay attention to the emotions the situation you selected brings up for you.

Appendix C: Self-Compassion Condition Writing Instructions

Get in touch with the compassionate, caring part of yourself. To do this, it can be helpful to think back to a time where you felt compassion for someone else and had a desire to be helpful to them. It doesn't matter what you did or if you were actually helpful – what matters is to connect with the feeling in your body and mind of wanting to be helpful. Connect with this now, perhaps by closing your eyes, and imagining yourself expanding with compassion, connecting with a desire to really see what the other person is feeling and needing, and the desire to help them.

…

Now, keeping connected to your compassionate self as best as you can, bring to mind the situation from earlier which made you feel fearful, sad, anxious, or distressed. Let yourself feel the emotions this situation brings up for you.

Now imagine that you can look at yourself feeling these emotions, sort of like a compassionate fly on the wall. As this compassionate fly, observe the emotions you are feeling and imagine what the part of yourself feeling these emotions - your vulnerable part of self - may look like. For example, you may observe yourself feel sadness and imagine the sad part of yourself curled up and crying.

As you are observing this vulnerable part of yourself, recognize that you are a human being like everybody else who just found themselves here living this life as best you can. Stay in touch with your compassionate self, trying to understand the struggles your more vulnerable part of self is experiencing, and connecting with a desire to be helpful to this part of yourself.

117

As you observe yourself, write down what you are noticing that this more vulnerable part of yourself is feeling, how that vulnerable part of yourself looks, and what they are thinking. We suggest you spend 5 minutes on this writing task.

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Now, take a few moments to reconnect with your compassionate self and reread what you wrote. [Participant's response to the previous prompt was inserted here]

As you stay connected to this compassionate self – which may feel hard, that's okay – write a compassionate letter to this more vulnerable part of yourself that you were observing. It might help to follow the structure below to have some ideas of compassionate things you could say to yourself. For more ideas, you can also bring to mind a person who has been caring and supportive to you in the past, and recall what types of things they may say to you when expressing their support and care for you. We suggest you spend 5 minutes on this writing task.

Letter component 1: One way to start your letter might be to **empathize and validate your suffering** and link it to human nature. For example, you might say, "I see how hard this is for you, and how painful it is. It is understandable that you have been feeling sad and anxious about this – it's hard to be going through this. Many people would have a difficult time dealing with what you're dealing with."

Letter component 2: You might then move on to **express your desire to support or care for yourself**, even if this feels untrue or fake. It can still be helpful to say it. For example, you

might say, "I want you to know that I care about you and accept you even when you are feeling

sad or scared. I know that you are doing the best you can to navigate this difficult situation."

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Read your letter to yourself in a warm, supportive tone of voice, staying connected with

your compassionate self. Even if it feels fake and put on, that's okay. Just try it anyway. Notice

how it feels as you do this and try to let yourself experience your emotions as you do this. For

example, you may let yourself cry if sadness comes up.

[Participant's response to the previous prompt was inserted here]

Appendix D: Pure Exposure Condition Writing Instructions

Bring to mind the situation from earlier which made you feel fearful, sad, anxious, or distressed. When you're ready, connect with and write about your deepest thoughts and emotions about this situation. Write as much as you can, even if there are some aspects of your experience you are hesitant to write about. Write about what happened and what is happening now. Explore how you felt about it at the time the situation first presented itself and how you feel about it now. For example, you could write "When I first found out my classes were going to be online, I was relieved that going to class would not increase my risk for contracting COVID, and I was hopeful that my classes may actually be easier. Now I am feeling overwhelmed by all the asynchronous learning. I'm scared I will never be able to finish all the tasks I have to do."

All your writing will be completely confidential. Please don't worry about spelling or grammar when you're writing. Instead just **try to really let go and fully explore your deepest thoughts and feelings about your upsetting situation.** We suggest you spend 10 minutes on this writing task.

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Read what you wrote about your thoughts and feelings surrounding this situation. Notice how it feels as you do this and try to let yourself experience your emotions as you do this. For example, you may let yourself cry if sadness comes up.

In the previous writing task, you wrote: [Participant's response to the previous prompt was inserted here]

Appendix E: Control Condition Writing Instructions

Now bring to mind your plans for the next twenty-four hours. Consider events and hobbies as well as responsibilities such as coursework, assignments, household chores, and any other tasks you may have. Try not to write about your feelings about what is going to happen or your opinions about these plans. Instead focus on the facts. **Describe in detail hour by hour what you plan to do.** For example, "At 1pm I will read chapter 6 for my class. As I read the chapter, I will take notes in the margins of the book and highlight important content." Consider all the aspects of these tasks, breaking them down into how you plan to do them. We suggest you spend 5 minutes on this writing task.

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Now bring to mind your plans for the next week. As you did before, consider events and hobbies as well as responsibilities such as coursework, assignments, household chores, and any other tasks you may have. Try not to write about your feelings about what is going to happen or your opinions about these plans. Instead focus on the facts. **This time describe in detail day by day or task by task what you plan to do.** As you did before, break down each task into how you plan to do them. We suggest you spend 5 minutes on this writing task.

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Read what you wrote about your plans for the upcoming day and week. Notice how it feels as you do this and what thoughts come to mind.

For your plans for tomorrow, you wrote: [Participant's response to the first prompt was inserted here]

For your plans for this week, you wrote: [Participant's response to the second prompt was inserted here]

Appendix F: Results of Gender and Language Exploratory Analyses

We conducted two exploratory analyses to investigate if the effect of condition on Time 2 emotional distress tolerance differed by participants' first language or gender identity.

First Language

To investigate the effect of participants' first language on Time 2 (i.e., immediately post-intervention) emotional distress tolerance, we conducted an ANCOVA for each study sample. An English language categorical variable was created with two categories: primary language and secondary language. Time 1 (i.e., baseline) emotional distress tolerance was entered as a covariate and Time 2 emotional distress tolerance as the dependent variable. Condition, first language, and their interaction were entered as predictor variables. In the student sample, controlling for Time 1 emotional distress tolerance, which accounted for variation in Time 2 emotional distress tolerance, $F(1, 119) = 43.38$, $p < .001$, $n^2_p = .27$, the effect of first language, $F(1, 119) = 2.06$, $p = .154$, $n^2_p = .02$, and its interaction with condition, $F(2, 119) = 0.96$, $p = .387$, $n^2_p = .02$, on Time 2 emotional distress tolerance were both not significant. In the community sample, controlling for Time 1 emotional distress tolerance, which accounted for variation in Time 2 emotional distress tolerance, $F(1, 288) = 10.72$, $p < .001$, $n^2_p = .26$, the effect of language, $F(1, 291) = 0.68$, $p = .411$, $n^2_p = .00$, and its interaction with condition, $F(2, 291) = 1.73$, $p = .179$, $n^2_p = .01$, on Time 2 emotional distress tolerance were both not significant. Therefore, participants' first language did not affect the impact of conditions on emotional distress tolerance.

Gender Identity

To investigate the effect of participants' gender identity on Time 2 (i.e., immediately post-intervention) emotional distress tolerance, ANCOVAs were conducted. Gender identity had

three categories: cis male/trans male, cis female/trans female, and gender-queer. For each

sample, one participant was excluded from the analyses as they opted not to disclose their

gender. Time 1 (i.e., baseline) emotional distress tolerance was entered as a covariate and Time 2

emotional distress tolerance as the dependent variable. Condition, gender identity, and their

interaction were entered as predictor variables. In the student sample, controlling for Time 1

emotional distress tolerance, which accounted for variation in Time 2 emotional distress

tolerance, $F(1, 115) = 43.60$, $p < .001$, $n^2_p = .28$, the effect of gender identity, $F(1, 115) = 0.88$, p

$= .418$, $n^2_p = .02$, and its interaction with condition, $F(2, 115) = 0.93$, $p = .451$, $n^2_p = .03$, on

Time 2 emotional distress tolerance were both not significant. In the community sample,

controlling for Time 1 emotional distress tolerance, which accounted for variation in Time 2

emotional distress tolerance, $F(1, 288) = 102.98$, $p < .001$, $n^2_p = .26$, the effect of gender identity,

$F(2, 288) = 0.76$, $p = .468$, $n^2_p = .01$, and its interaction with condition, $F(3, 288) = 0.12$, $p =$

$.998$, $n^2_p = .00$, on Time 2 emotional distress tolerance were both not significant. Therefore,

participants' gender identity did not affect the impact of conditions on emotional distress

tolerance.