TAKE A STEP BACK: EXAMINING REGULATORY STRATEGIES IN THE FACE OF FUTURE THREATS

by

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ABSTRACT

LENA ETZEL. Take a step back: Examining regulatory strategies in the face of future threats. (Under the direction of DR. SARA M. LEVENS and DR. JENNIFER B. WEBB)

Repetitive negative thinking (RNT) is a maladaptive coping mechanism associated with numerous clinical disorders, and may represent an attempt to avoid unpleasant internal experiences (e.g., anxiety). Worry, a type of RNT associated with uncertain future events, commonly occurs in mood disorders as well as with other sub-clinical concerns. As a result, worry may exacerbate existing health conditions, worsening burden on economic and healthcare systems. Drawing from transdiagnostic and acceptance-based frameworks, the present work represents a novel comparison of brief, cost-effective writing interventions for state worry, event-specific worry, and state anxiety in two non-clinical samples. Undergraduate students (N = 138; Study 1) and adults recruited via MTurk (N = 145; Study 2) were randomized to one of three writing conditions: self-immersion, self-distancing, or self-compassion and asked to write about a self-identified future threat. Across both studies, participants in the self-compassion condition reported significantly less event-specific worry and lower state anxiety than in the remaining two conditions, suggesting that self-compassion may facilitate shifts in relationships to unpleasant experiences and affective reactions to future uncertainty. In Study 1, participants in the self-compassion condition reported significantly lower state worry compared to individuals in the self-immersion condition. Collectively, both studies advance prior research by highlighting the promising role of self-compassion in helping improve tolerance of difficult emotions in a novel self-referential context.

DEDICATIONS

This thesis is dedicated to my parents, Margit and Jochen Etzel, and my brother, Mark Etzel, for their endless love, support, and encouragement. Thank you for instilling in me a lifelong love for learning and for encouraging my never-ending sense of curiosity.

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INTRODUCTION

Over the past two decades, a growing body of work has examined the role of repetitive negative thinking (RNT) as an underlying transdiagnostic mechanism present across a variety of emotional disorders (Ehring & Watkins, 2008). Specifically, RNT is considered to be a cognitive process characterized by three components: RNT is (a) repetitive, (b) passive and/or relatively uncontrollable and (c) focused on negative content (Ehring & Watkins, 2008) and has been linked to a variety of subclinical concerns (e.g., anxiety, shame, general distress) as well as different clinical diagnoses (Mahoney et al., 2012; McEvoy et al., 2013). For example, individuals diagnosed with Major Depressive Disorder (MDD) engage in repetitive and passive thinking about their symptoms, possible causes, and consequences. Similarly, individuals with Posttraumatic Stress Disorder (PTSD) think repeatedly about the traumatic experience and associated memories, while individuals with Social Anxiety Disorder (SAD) experience recurrent thoughts about recent social interactions, including self–appraisals and external evaluations. In addition, individuals with Obsessive-Compulsive Disorder (OCD) report uncontrollable, recurring thoughts, urges or mental images (i.e., obsessions) that cause anxiety. As such, it is not surprising that clinicians increasingly rely on transdiagnostic treatment modalities that attempt to target maladaptive patterns spanning across diagnoses, rather than specifically treating separate clinical disorders (e.g., Frank & Davidson, 2014; Wilamowska et al., 2010).

Two commonly studied forms of RNT are rumination and worry, both of which have been found to be present across multiple clinical disorders (Drost et al., 2014; McEvoy et al., 2013). While not within the scope of this paper, existing research

continues to clarify the relationship between rumination and worry. While both processes are said to be cognitively abstract in nature, linked to difficulties in switching attention from negative stimuli, and demonstrate similar negative consequences (e.g., concentration difficulties), research has highlighted aspects that differentiate these two processes, such as linking rumination with themes of loss and a primary focus on the past (for a detailed review, see Nolen-Hoeksema et al., 2008). In the literature, worry has been defined as a relatively uncontrollable chain of primarily verbal-linguistic, negatively affect-laden thoughts about uncertain events with the potential for one or more future negative outcomes (Borkovec, 1994; Borkovec et al., 1983). Notably, worry, as one type of RNT, has been identified as a common concern among individuals with diagnosable clinical disorders as well as non-clinical populations (Holaway et al., 2006).

A number of strategies seem to be promising for mitigating worry. While different theoretical frameworks have prompted the development of specific treatment modalities to treat worry in the context of Generalized Anxiety Disorder (GAD; for a review see Behar et al., 2009), the present study focuses on two specific approaches, self-distancing and self-compassion, to target worry in non-clinical samples. Self-distancing refers to a change in one's perspective from a first-person (immersed) point of view to an ego-decentered, "fly-on-the-wall" perspective (Kross & Ayduk, 2011; Kross et al., 2005), and has been shown to mitigate the impact of negative affective responses to both laboratory and real-world stressors (e.g., Kross et al., 2014; Kross et al., 2017; White et al., 2018). Similarly, self-compassion also involves a change in perspective as individuals consider their experiences within the context of the larger human existence, from a stance of non-judgmental kindness and present-moment awareness (Neff, 2003a, 2003b). In the

current study, we draw upon the transdiagnostic model, the intolerance of uncertainty model of worry, and acceptance-based frameworks, and propose that a brief writing intervention to promote either self-distancing or self-compassion can mitigate worry in two non-clinical (college and national) samples. Following a brief review of relevant theoretical frameworks as well as an overview of self-distancing and self-compassion research, we discuss the underlying mechanisms that may explain the potential of both self-distancing and self-compassion to ameliorate worry.

While worry is a form of RNT that has been identified as a transdiagnostic factor (Drost et al., 2014; McEvoy et al., 2013), research to date has primarily considered worry to be uniquely related to Generalized Anxiety Disorder (GAD, Kertz et al., 2012), particularly after it was included as the hallmark symptom of GAD in DSM-III-R (Crocq, 2017). The study of worry within the context of GAD is likely also motivated by the relatively high lifetime prevalence of GAD in the US (5%; American Psychiatric Association, 2013), the debilitating potential of the condition, and the burden it poses on US economic and healthcare systems through decreased work productivity and increased use of health care services (Valentiner et al., 2014). However, the predominant focus on studying worry solely within the context of GAD has led to an incomplete understanding of worry for two notable reasons.

First, research has illustrated that worry is a common mental activity outside of the clinical context (Holaway et al., 2006; Tallis et al., 1994) and is in its "mild" form defined as "transient, generally limited in scope, and experienced by the majority of individuals" (Ruscio, 2002, p. 378). Indeed, empirical evidence supports a dimensional structure of worry, suggesting that it exists along a continuum with "mild" and

"pathological" worry representing opposite ends of the spectrum (Ruscio, Borkovec, and Ruscio, 2001). While initially demonstrated in a college sample, Olatunji et al. (2009) utilized taxometric procedures to examine the latent structure of worry in community and clinical samples, and provided additional support for the dimensional conceptualization of worry. While worry closer to the "mild" end of the spectrum can be an adaptive strategy to help individuals cope as they actively contemplate potential solutions to perceived challenges (e.g., Davey, 1994; Olatunji et al., 2009), it has also been argued to be associated with a number of symptoms even outside of the context of GAD (Kertz et al., 2012), thus making it an even more salient target.

Second, and consistent with prior work examining worry as a transdiagnostic mechanism, pathological worry does not seem to be a unique symptom of GAD but rather a prominent feature across numerous (anxiety) disorders (Davey & Wells, 2006). Namely, Kertz et al. (2012) demonstrated that meeting criteria for at least one clinical diagnosis (i.e., Depression, Bipolar Disorder, Psychosis) or presenting with a primary mood disorder and a comorbid anxiety disorder (other than GAD) was associated with higher levels of worry after controlling for GAD diagnosis. Notably, the authors highlighted that GAD only explained 10% of the variance, and together with the other diagnoses, the model only accounted for 19% of the variance, leaving much of the variance unexplained, and suggesting that worry is not merely a diagnostic feature. While primarily correlational in nature, worry has been linked to a number of health outcomes (Brosschot & Thayer, 2004), including increased pain in an elderly sample (Blyth et al., 2011), sleep disturbance and pain-related interference in a sample of patients with multiple sclerosis (Bruce & Arnett, 2009) insomnia (Harvey & Greennall, 2003), and

greater somatic complaints in a sample of high school students even after controlling for anxiety (Broschott & van der Doef, 2006). The potential interplay between worry and health concerns underscores the importance of research examining strategies that can mitigate worry in diverse non-clinical samples.

Theoretical Conceptualization of Worry

The dimensional nature of worry, as well as its prevalence across a variety of diagnoses, points to an additive or graded etiology (e.g., environmental and person-specific factors) rather than a discrete etiological source (e.g., one specific gene, cognitive dysfunction, or environmental stressor; Olatunji et al., 2009). Such reasoning is consistent with prominent etiological frameworks, which suggest that a number of factors may explain worrying and position individuals along the continuum with varying degrees of worry (Akbari & Khanipour, 2018). Namely, models such as the intolerance of uncertainty model (Dugas et al., 2001; Koerner & Dugas, 2006), the metacognitive model (Wells, 1999), the model of experiential avoidance (Hayes et al., 1999; Hayes et al., 1996), the acceptance-based model (Orsillo & Roemer, 2007, Roemer & Orsillo, 2005), and the emotion dysregulation (cf. Mennin et al., 2005; Mennin et al., 2007) or the emotional schema model (Leahy, 2007) have all offered different theoretical explanations of the development, maintenance, or progression of worry (i.e., from mild to pathological worry).

In an effort to characterize transdiagnostic risk for worry in a non-clinical sample, Akbari and Khanipour (2018) examined a number of explanatory models and identified intolerance of uncertainty (IU) as the most robust factor to explain worry. IU refers to “a tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain

situations" (Buhr & Dugas, 2009, p. 216). Perception of threat in response to future events has previously been identified as a transdiagnostic (cognitive) *vulnerability mechanism* and worry has consequently been viewed as a *response mechanism* (Frank & Davidson, 2014). Building on this transdiagnostic framework of worry (Frank & Davidson, 2014), the rise of third-wave treatment approaches (e.g., Acceptance and Commitment Therapy, ACT; Hayes et al., 1999; mindfulness-based cognitive therapy; MBCT, Segal et al., 2002) have highlighted the necessity to target mechanisms traversing to clinical disorders and relevant for therapeutic change. For instance, acceptance-based behavioral therapies (for a detailed review, see Orsillo & Roemer, 2007; Roemer & Orsillo, 2005) are thought to target three central transdiagnostic elements: a) internal experiences, b) experiential avoidance, and c) behavioral restrictions.

Indeed, individuals who are more intolerant of uncertainty may espouse rigid beliefs about the experience of uncertainty (e.g., "uncertainty is dangerous or threatening", or "I can't deal with/tolerate uncertainty"; Koerner & Dugas, 2006) which encourage avoidance. This way of relating to unpleasant internal experiences has been termed "fusion" in ACT (Hayes et al., 2006; Hayes et al., 1999). Namely, individuals may mistake transient internal experiences (e.g., emotions, thoughts) as true indications of reality or the self (Roemer & Orsillo, 2010). Worry may function as a cognitive avoidance strategy in an attempt to control or avoid unpleasant internal experiences associated with uncertainty (e.g., anxious thoughts and emotions; Borkovec et al., 2004; Frank & Davidson, 2014). Accordingly, prior work has summarized that IU perpetuates worry via three mechanisms (i.e., positive beliefs about worry, negative problem orientation, and cognitive avoidance; Koerner & Dugas, 2006). More recently, Akbari

and Khanipour (2018) identified avoidance as a linking factor and mediator between IU and pathological worry. Such a finding also aligns with Hayes and colleagues' model of experiential avoidance (Hayes et al., 1999): If individuals appraise their internal experiences as threatening, they may attempt to avoid or escape their experience and associated affective reactions (e.g., anxiety). This type of reaction (i.e., experiential avoidance) may not only paradoxically trigger the amplification of internal responses, but may also occur at the expense of engaging in behaviors that are fulfilling (Orsillo & Roemer, 2007). Thus, worry allows individuals to respond to the sense of threat due to ambiguity by preparing for potential outcomes and may cause them to believe that they can prevent negative outcomes from occurring, leading to a greater sense of control and less internal distress in the short term (Freeston et al., 1994; Orsillo & Roemer, 2007). However, considering that most catastrophic outcomes are relatively low base-rate events, worrying may be perceived as a preventative strategy to explain the nonoccurrence of the outcome (Behar et al., 2009; Boswell et al., 2013), thus negatively reinforcing and strengthening the worry process while preventing the modification of maladaptive threat appraisals (Frank & Davidson, 2014).

Notably, existing mindfulness- and acceptance-based treatment modalities that aim to change how individuals relate to their internal experiences appear to be effective for a variety of presenting concerns (Khoury et al., 2015; Vollestad et al., 2012). However, most of these treatments are limited by factors including cost, time demands, and the need to attend sessions in person, which can pose barriers to enrolment for individuals (Economides et al., 2018). In the context of worry, it is also likely that treatment is typically sought out by individuals who meet typical diagnostic criteria (e.g.,

pathological worry in the context of GAD), thus potentially leaving out those at the lower end of the worry dimension (i.e., sub-clinical presentations). In light of these considerations, a growing body of transdiagnostic research has considered flexible combinations of component interventions (Frank & Davidson, 2014) as well as remotely-delivered interventions (Bakker et al., 2018; Economides et al., 2018) to increase accessibility. The following sections will discuss two strategies, self-distancing and self-compassion, which, given their alignment with acceptance-based approaches, may be well-suited to help individuals respond more effectively to uncertainty.

Self-Distancing and Worry

Various scholars have suggested that perspective-taking may influence individuals' relationship with their internal experiences (Kross et al., 2005; Mischel et al., 1989). In particular, humans share the ability to shift from their first-person (immersed) point of view to an ego-decentered perspective (Kross et al., 2005; Kross & Ayduk, 2011). As such, individuals may reflect on events or think about situations from a distanced, outside observer viewpoint by being cued to adopt a "fly on the wall" perspective (rather than immersing oneself). This "self-as-observer" perspective is a critical component of acceptance-based frameworks such as ACT (e.g., Hayes et al., 2012), which utilize cognitive distancing to facilitate separating, detaching, or "defusing," from thoughts (e.g., I can't deal with uncertainty) to minimize experiential avoidance and improve tolerance of difficult emotions (e.g., anxiety, depression). While mere rehearsal of emotionally-arousing details of negative past events (i.e., recounting details from a self-immersed stance) is thought to further exacerbate negative affect, a distanced perspective permits individuals to gain insight and closure by considering

underlying factors and the broader context of the situation (i.e., reconstrue; Ayduk & Kross, 2010b; Kross & Ayduk, 2008; Kross et al., 2012). Thus, generating psychological distance has been argued to attenuate the impact of a range of unpleasant emotions (for a review, see Ayduk & Kross, 2010a, 2010b) highlighting its potential for use in transdiagnostic and individualized treatment approaches (Frank & Davidson, 2014). Previous work has suggested that such cognitive shifts are reflected in one's language use (i.e., self-talk). In line with an acceptance-based perspective (Hayes et al., 2012), changes in the language used to describe thoughts may facilitate cognitive distance (Nook et al., 2017). A sample of university affiliates who distanced themselves when reflecting on past experiences were found to use fewer first-person pronouns when describing their thought processes as opposed to individuals who were instructed to self-immerse (Kross & Ayduk, 2008). Similarly, Kross et al. (2014) demonstrated that shifts in undergraduates' language use can promote self-distancing. Notably, distancing via language has been argued to be less cognitively demanding compared to other regulatory strategies such as active cognitive reappraisal (Orvell et al., 2019).

Emerging work has also supported the beneficial use of linguistic distancing when reflecting on future threats standardized in laboratory settings. For instance, Kross et al. (2014, Study 2) demonstrated that in a sample of undergraduate females, those who were prompted to use non-first-person pronouns (e.g., "you" or their name) when thinking about an *in vivo* laboratory-induced stressor experienced greater decreases in state anxiety than those who were prompted to use first-person pronouns. In another study, a sample of undergraduates was directed to think about their feelings relating to an upcoming anxiety-provoking performance task utilizing non-first-person pronouns such

as their name or “you” (Kross et al., 2014, Study 3). Consistent with previous work, undergraduate participants using non-first-person pronouns (instead of first-person pronouns such as “I”) reported lower levels of negative affect after the laboratory stressor. Similarly, non-first-person pronoun use has also been associated with less event-specific worry, or anticipatory anxiety, prior to an anxiety-provoking performance task (Kross et al., 2014, Study 4). Lastly, White et al. (2018) reported that self-distancing was associated with reduced emotional reactivity when a sample of undergraduate students reflected on a self-selected future stressor from a distanced perspective. In light of these findings and consistent with the acceptance-based perspective, it is likely that immersion (or first-person pronoun use) promotes cognitive fusion, or one being attached or stuck to their distressing thoughts and associated emotions, and therefore prompts experiential avoidance (Harris, 2009). Conversely, the distanced perspective is more consistent with cognitive defusion and, thus, is associated with less reactivity to thoughts and feelings. Indeed, a self-immersed manner of relating to one’s private experiences has consistently been associated with maladaptive outcomes and has commonly been used as a control or comparison group in studies examining distancing (e.g., Kross et al., 2014).

To examine distancing in the general population and to diversify the sources that may bring about worry in individuals, Kross et al. (2014, Study 5) recruited adult participants using Amazon’s Mechanical Turk (MTurk) recruitment platform. In this study, participants were prompted to process their current thoughts and feelings surrounding an upcoming social anxiety event in writing. Notably, participants in the non-first-person language condition appraised their anxiety-provoking experience as more challenging (and less threatening), which has previously been linked to reduced

anticipatory anxiety. Similarly, Kross et al. (2017) induced a distanced (or immersed) perspective and prompted participants to process worry-related thoughts surrounding Ebola, a serious epidemic in 2014. MTurk participants who were instructed to distance themselves using third-person self-talk were able to generate more fact-based reasons not to worry. For individuals with high baseline Ebola worry, generating fact-based reasons not to worry led to reductions in (anticipatory) Ebola worry as well as state worry.

Collectively, these findings further suggest that distancing via language may aid emotion regulation in the context of potential future threat by altering how individuals relate to their inner experience. More specifically, the aforementioned research suggests that linguistic distancing may ameliorate anticipatory concerns in reference to an ambiguous future outcome more effectively than first-person language use. However, no study to our knowledge has examined whether writing from a distanced perspective can lower individuals' present moment (i.e., state) worry and anxiety pertaining to a self-relevant future threat. That is, changes in anxiety and worry-related constructs across conditions have either not been tested (Kross et al., 2014; Study 4 and 5), or the second time point of measurement was after the stressor has already passed (i.e., laboratory performance task; Kross et al., 2014; Study 2). Understanding whether self-distancing reduces experiential avoidance (as indicated by decreased state worry and event-specific worry) and enables individuals to change how they relate to difficult emotional reactions (as evidenced by decreased state anxiety) in response to a self-identified future threat is important yet remains understudied. However, hypotheses regarding these relationships are restricted to those regarding between-group differences, as the specific direction of

change and the magnitude of this effect cannot be specified based on the results of extant work.

Hypothesis 1: Compared to participants in the self-immersion condition, participants in the self-distancing condition will report less event-specific worry, state anxiety, and state worry post-intervention.

Self-Compassion and Worry

Recent calls have highlighted the need to compare distancing to other potential emotion regulation strategies (Orvell et al., 2019). One strategy that appears to be a particularly fitting target is self-compassion, particularly as it is associated with acceptance-based approaches (e.g., MBCT, Segal & Teasdale, 2018; Segal et al., 2002) such as defusion (Marshall & Brockman, 2016) and has been used in the clinical context to help individuals relate differently to their inner experiences (e.g., Compassion-focused Therapy (CFT), Gilbert, 2009; Mindful self-compassion (MSC) program, Neff & Germer, 2012). Broadly, self-compassion is just one example that reflects the growing appreciation for and integration of Eastern-born concepts in Western psychology (Aich, 2013; Shonin et al., 2013). According to Neff (2003a), the three conceptually distinct, yet interconnected components of self-compassion are: self-kindness (vs. self-judgment), common humanity (vs. isolation), and mindfulness (vs. over-identification). Self-kindness enables individuals to respond to suffering, failure, or one's perceived inadequacies with understanding and kindness instead of criticism and judgment. Similarly, common humanity entails that individuals regard their experience as an integrative part of the larger human existence by recognizing that all humans are imperfect, thus contrasting feelings of separation and isolation. Lastly, mindfulness

allows individuals to view their distressing thoughts and feelings from a balanced, open-minded perspective rather than absorb oneself in and overidentify with the painful experience. Collectively, self-compassion allows individuals to develop active, nonjudgmental, compassionate, and expansive awareness of their internal experiences.

A growing body of research has demonstrated that self-compassion is associated with an array of adaptive psychological health outcomes. For instance, self-compassion has previously been linked to lower levels of negative affect, depression, thought suppression, anxiety, rumination (e.g., Ehret et al., 2018; Leary et al., 2007; Neff, 2003a; Neff et al., 2007), appearance- and body image-related outcomes (Seekis et al., 2017; Ziemer et al., 2018), and indicators of psychological well-being such as happiness and life satisfaction (Smeets et al., 2014; Shapira & Mongrain, 2010). When exposed to hypothetical negative scenarios (Leary et al., 2007), undergraduates higher in self-compassion engaged in less catastrophizing, which has previously been argued to play a key role in anxious thought patterns (Vasey & Borkovec, 1992). Catastrophizing likely biases individuals toward using worry in an attempt to resolve potentially distressing thoughts and emotions arising during ambiguous situations. Neff et al. (2007) also illustrated that self-compassion buffered undergraduate participants against anxiety when exposed to self-evaluative situations. Broadly, research has shown that self-compassion is negatively correlated with rumination (Neff, 2003a), anxiety (Leary et al., 2007; Neff et al., 2005; Raes, 2010), academic-related worry (Williams et al., 2008), fear of failure (Neff et al., 2005), and trait-like worry (Raes, 2010; Smeets et al., 2014). It is possible that generating self-kindness, psychological distance, and recognizing that failure and loss, like success, are part of the human experience may attenuate negative emotions

(Leary et al., 2007). However, while these findings are promising, most of the existing research is correlational and has examined the relationship between trait-based self-compassion and (state) worry and anxiety.

Beyond trait-based differences in self-compassion (Neff, 2003a), self-compassion can be induced experimentally and such an approach has been shown to ameliorate psychological distress indicators and enhance well-being (Ehret et al., 2018; Leary et al., 2007; Shapira & Mongrain, 2010; Smeets et al., 2014; Ziemer et al., 2018). Accordingly, Smeets et al. (2014) demonstrated that increases in self-compassion following a three-week, three-session self-compassion meditation training predicted changes in trait-based worry (Smeets et al., 2014). One common approach to induce self-compassion in research studies has been through writing prompts (e.g., Leary et al., 2007; Shapira & Mongrain, 2010; Ziemer et al., 2018). In these studies, inducing self-compassion through writing has been associated with reductions in depressive symptoms, increases in positive affect, and less negative affect. Similarly, Harwood and Kokovski (2017) demonstrated that writing compassionately about a past mistake reduced subsequent anticipatory anxiety in response to a laboratory speech task for non-clinical individuals with high social anxiety. Contrary to the dimensional conceptualization of worry mentioned above, the researchers dichotomized the severity of anxiety to create low/high-anxiety groups, which might have affected the findings and possibly indicate some uncertainty regarding the actual impact of compassionate writing interventions on individuals who experience lower (or varying degrees of) social anxiety. More recently, Brooker et al. (2019) demonstrated that an 8-week mindful self-compassion program successfully reduced adult cancer survivors' fear of cancer recurrence, highlighting its applicability to increase

tolerance for health-related uncertainty and perceived threat. While initial work is promising, more research is needed to understand whether inducing self-compassion (via writing) can help individuals relate to a self-selected threat in ways that does not promote worrisome thinking. Existing interventions to promote self-compassion are not always feasible, because they span at least one week (e.g., Shapira & Mongrain, 2010; Smeets et al., 2014). Furthermore, many other studies do not experimentally induce self-compassion but rather measure its trait-like effect (Leary et al., 2007; Neff, 2003a; Neff et al., 2007). Previous work that has compared a self-compassion writing condition to a writing control condition demonstrated that only the self-compassion intervention yielded lower levels of negative affect, suggesting that self-compassionate writing carries benefit beyond the act of writing itself (Leary et al., 2007). As such, research examining brief self-compassion writing interventions is needed to examine its usefulness for regulating worry and anxiety relating to potential future threats.

Self-Distancing and Self-Compassion

While self-distancing and self-compassion have not been studied in concurrently, linguistic markers suggest a potential overlap between the two constructs. As mentioned earlier, previous work has demonstrated that linguistic shifts can facilitate self-distancing (Kross et al., 2014; Nook et al., 2017). Similarly, prior work on self-compassion has highlighted that individuals who take part in a self-compassion writing intervention utilized fewer first-person singular pronouns (i.e., I, me, mine) than a traditional expressive and a control writing condition (Ziemer et al., 2018). This commonality in non-first-person pronoun use is consistent with the conceptualization of self-compassion: Neff (2003a) posited that adopting a mindful perspective and generating a “mental space”

(p. 224) allows individuals to recognize that pain, failure, and inadequacies are part of common humanity (Leary et al., 2007). As such, self-compassion, much like we hypothesize for self-distancing, may promote individuals detaching from their thoughts to minimize experiential avoidance and improve tolerance of difficult emotions.

Given the promising effects associated with distancing, the observed benefits associated with self-compassion may be related to a distanced perspective inherent to the construct of self-compassion, as suggested by their linguistic overlap. Yet, while self-distancing and compassion may have similar linguistic expression, it is reasonable to argue that self-compassion may confer additional benefits as it also includes self-kindness and common humanity. Specifically, self-compassion enables individuals to feel cared for, connected with others, and emotionally calm (Gilbert, 2005). Thus, self-compassion has been argued to deactivate the psychophysiological threat system typically triggered in response to stressful experiences. It is postulated that self-compassion also activates the self-soothing system as individuals respond to their suffering with understanding and kindness (Gilbert, 2016). In addition, self-compassion has been hypothesized to reduce feelings of isolation as individuals may think that others experience similar worries (Leary et al., 2007). Building on this, it is possible that the generation of self-kindness enables individuals to mitigate state worry beyond what distancing could enable individuals to do. Thus, increased self-kindness and an ability to consider worries as a part of common humanity may explain why self-compassion may have the capacity to lower experiential avoidance (as indicated by reduced worry and anxiety) even more so than distancing may do. This rationale leads to our second set of hypotheses, with which we seek to both replicate and extend prior findings:

Hypothesis 2a-b: Compared to individuals in the self-immersion condition (a) and self-distancing condition (b), participants in the self-compassion condition will experience less event-specific worry, state anxiety, and state worry post-intervention.

The present research consisted of two studies to evaluate the efficacy of a brief, single-time writing intervention using distancing and self-compassion (versus self-immersion) in mitigating state worry, state anxiety, and event-specific worry associated with a future self-selected threat. Study 1 recruited undergraduate students from a large publicly-funded institution located in the Southeastern United States using the Department of Psychological Science's online research sign-up system (SONA), whereas Study 2 recruited participants via MTurk (i.e., a national recruitment platform on Amazon). While there was no theoretical rationale to make predictions about potential sample differences and it is not within the scope of this project, conducting two simultaneous studies allowed us to explore more broadly whether recruitment source (i.e., undergraduate students vs. national MTurk sample) and context (i.e., in-person vs. remotely online) quantitatively different findings. Prior studies have used the self-immersion condition as a control or comparison group given that it does not seem to differ from a neutral condition (i.e., no manipulation of participants' perspectives; Mischkowski et al, 2012), but rather represents the default perspective of individuals when reflecting and thinking about personal memories (Crawley & French, 2005). Accordingly, we used self-immersion as a control by asking participants to write about their source of worry using first-person pronouns.

STUDY 1: METHOD

Participants

After IRB approval was obtained (#18-0532), a total of 142 participants took part in the study. Data cleaning included removing participants who demonstrated insufficient effort responding (i.e., insufficient variability in responses and/or missed more than 20% of the items on the CWI and/or STAI-S). Additionally, we removed those who wrote less than 200 characters and/or failed to follow instructions when responding to the writing prompts, as indicated by a missing response, description of a past event, or the use of nonsense words. This process yielded a final analytical sample of 138 SONA participants ($N_{females}$ = 81; M_{age} = 20.35; SD_{age} = 2.48).

Procedure

Prior to data collection, the study was pilot tested by research staff to maximize readability and clarity of instructions and prompts. Participation was restricted to individuals who are at least 18 years old, fluent in English, and able to type using a computer keyboard. Participants indicated that they match these eligibility criteria once they signed up for an in-person lab session. Eligibility was confirmed when participants arrived for their in-person session. Participants provided written consent after which they were instructed on the general study procedures. Participants completed the entire study online (using Qualtrics) on a computer in the laboratory (approximately 30-45 minutes in length). To avoid distraction and ensure privacy as up to three individuals could participate simultaneously, all participants were asked to wear provided headphones or earplugs and were seated apart from one another. After responding to an initial set of questionnaires and baseline measures, participants identified a future threat and were

randomly assigned to respond to one of three condition prompts: self-immersion, self-distancing, self-compassion (see Appendix A). All participants were asked to write for at least three minutes and use a minimum of 200 characters for their responses. Before and after the writing interventions, three measures examining state anxiety, state worry, and event-specific worry were administered. Additionally, participants were asked to respond to questions regarding their language use during the intervention, which later served as a manipulation check. Furthermore, participants also completed exploratory measures not included in the planned analysis (see Appendix B). Upon completion, the research assistant granted participants one research credit and informed participants that they would be notified if they won the random drawing to receive one of two $20 Target gift cards after completion of the project.

Measures

Outcome Measures

Event-Specific Worry. A visual analog scale (VAS; Chrichton, 2001; Wewers & Lowe, 1990) was used to examine the degree of event-specific worry using a single-question. A horizontal line, 100 mm in length, was anchored by descriptors at each end. Participants needed to indicate a point on the line that they felt like represented their current perception of their self-identified future threat. Similar to Kross et al. (2014), the descriptor words were “not very worried/anxious” and “extremely worried/anxious”. Instructions were modified to match the perception of worry and the VAS was pilot tested.

State Anxiety. The 20-item State-Trait Anxiety Inventory – State subscale (STAI; Spielberger et al., 1983) was administered to measure participants’ state anxiety.

The scale ranged from 1 (not at all/almost never) to 4 (very much so/almost always) and an example item included "I feel nervous" (S-Anxiety). Higher scores indicated greater state anxiety. Validation work suggested high internal consistency alpha coefficients for high school students (α = .86) and military recruits (α = .95; Spielberger, 1983). In a college sample, the STAI-state measure successfully discriminated between a group under high and low stress conditions (Metzger, 1976). In the current study, baseline and post-intervention Cronbach's alpha were 0.5 and 0.59, respectively.

State Worry. The 5-item Current Worry Index (CWI; Kelly, 2002) was used to measure participants' general state worry. On a scale from 1 (strongly disagree) to 7 (strongly agree), participants rated statements that corresponded with their current thoughts and feelings. An example item included "I am currently more worried than usual". Kelly (2002) argued that the CWI offers a useful tool for researchers to capture state-level changes in worry. Validation research supports the convergent and discriminant validity of the measure (Kelly, 2002). It is sensitive to worrisome situations and correlates with measures of state anxiety, stress, and a VAS measure of current worry. Research has demonstrated the measure's high internal consistency (α = .88). In the current study, both baseline and post-intervention Cronbach's alpha were 0.93.

Covariates

Covariates consisted of trait-level and demographic variables that were thought to likely covary with the focal predictor variables, and were used to assess for the presence of baseline group-level differences, primarily to evaluate the integrity of the randomization process.

Trait Worry. To control for potential differences in trait-worry, the 16-item Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) was administered. On a scale from 1 (not at all typical of me) to 5 (very typical of me), participants rated statements such as "As soon as I finish one task, I start to worry about everything else I have to do".

Trait Anxiety. Similarly, potential differences in trait anxiety were examined with the State-Trait Anxiety Inventory – trait subscale (STAI – T; Speilberger et al., 1983). The measure contains 20 items and items are rated on a 4-point scale ranging from not at all/almost never to very much so/almost always.

Self-Compassion. The 26-item Self-Compassion Scale (SCS; Neff, 2003a) captured participants' self-compassion as conceptualized by Neff (2003a). Rated on a scale from 1 (almost never) to 5 (almost always), items belong to one of three lower-level constructs. Collectively, they form a higher-order construct of self-compassion.

Demographics. Variables included age, gender, race, occupation, year in school, height/weight, mental health diagnosis, previous trauma, current psychotherapy/counseling, and medication.

STUDY 1: STATISTICAL ANALYSES

All 142 participants wrote at least 200 characters in their qualitative responses to the prompts and were therefore included in the analyses. Following Dunn et al.'s (2018) recommendations, individuals' response variability (IRV) served as an index of insufficient effort responding (IER). Using a random selection of survey items, participants whose IRV was lower than two standard deviations from the sample's mean IRV were excluded from the analyses ($N = 2$). We also examined participants' qualitative responses to identify those who did not follow instructions. Participants who failed to follow instructions (e.g., copied/pasted instructions, wrote nonsense words, wrote about a past event) were excluded ($N = 1$). Lastly, participants who missed a substantial number of items (i.e., missed more than 20% of the items on the CWI and/or STAI-S) were excluded ($N = 1$). Thus, a total of four participants ($N_{SI} = 1$, $N_{SD} = 2$, $N_{SC} = 1$) were excluded from the analysis, yielding a final analytic sample of 138 participants.

All the manipulation check items yielded statistically significant differences between the three groups: SI (X^2 (6, $N = 138$) = 48.36, $p < .001$), SD (X^2 (6, $N = 136$) = 66.80, $p < .001$), and SC (X^2 (6, $N = 138$) = 17.27, $p < .005$). Specifically, a majority of participants estimated using condition-consistent linguistic markers "a moderate amount" or "a lot": In the SI condition, 89% indicated having used first-person pronouns (versus 33% in SD and 63% in SC), in the SD condition, 76% indicated having used non-first-person pronouns (versus 2% in SI and 17% in SC), and in the SC condition, 73% indicated having used compassionate language (versus 43% in SI and 40% in SD).

Data were analyzed with IBM SPSS software (version 26) using descriptive statistics, chi-square tests, independent sample t-tests, and repeated measures ANOVA.

The sociodemographic and baseline (VAS, CWI, STAI-S) characteristics of participants in each of the three writing conditions (self-immersion, self-distancing, and self-compassion) are presented in Table 1. Independent samples t-tests and chi-square analyses indicated that the three conditions were comparable at baseline on all demographic variables (i.e., age, gender, race, all *p*s>.05, see Table 1). There were also no statistically significant mean differences among the three groups on baseline measures and trait measures (PSWQ, SCS, STAI-T). Hence, the absence of significant pre-existing mean differences between the conditions suggests that the randomization procedure was successful at creating equal groups, obviating the need to control for any of these variables in our analyses.

Given the randomized design of the present work, the absence of significant group differences on baseline/pre-intervention measures (Dimitrov & Rumrill, 2003), we conducted three repeated measures ANOVAs to examine whether participants' mean change scores of event-specific worry (VAS), state anxiety (STAI-S), and state worry (CWI) differed by condition using separate analyses for each dependent variable. The pre- and post-intervention measures served as the within-subject, repeated measures factor and the three writing conditions (SI, SD, and SC) served as the between-groups variable. Before conducting the repeated measures ANOVAs, assumptions were examined. Given that the outcome variables were only measured at two time points (pre- and post-intervention), sphericity assumption was met. Follow-up independent samples t-tests for each outcome variable were conducted to further examine any significant interaction term of each repeated measure ANOVAs. Prior to that, assumptions of equality of error variance as indicated by Levene's test (*p*s > .05) were examined and

adjusted accordingly (i.e., equal variances not assumed was used if $p < .05$). The difference change scores for all three conditions were calculated by subtracting each of the three baseline scores from each of the three post-intervention scores (e.g., state anxiety Time 2 – state anxiety Time 1), with a negative mean scores indicating a decrease from Time 1 to Time 2, and a positive mean score reflecting an increase from Time 1 to Time 2.

STUDY 1: RESULTS

First, three repeated measures ANOVA were conducted to assess whether participants' mean levels of event-specific worry (VAS), state anxiety (STAI-S), and state worry (CWI) differed by condition using separate analyses for each dependent variable. Results revealed statistically significant changes in event-specific worry ($F(2,134) = 13.56$, $p < .001$), state anxiety ($F(2,135) = 5.99$, $p = .003$), state worry ($F(2,134) = 3.81$, $p = .024$), and as a function of condition (see Table 2 for pre-/post-intervention *M*s and *SD*s).

Next, independent samples t-tests for each the three outcome variables were conducted to further examine the significant interaction term of each of the repeated measure ANOVAs. Contrary to our hypothesis 1, participants in the self-distancing condition did not report significantly less event-specific worry, state anxiety, and state worry, *p*s > .05 than participants in the self-immersion condition (see Tables 3-5). However, in support of hypothesis 2a, participants in the self-compassion condition reported significantly less event-specific worry ($t(85) = 4.65$, $p < .001$, $d = 1.01$), state anxiety ($t(94) = 3.11$, $p = .002$, $d = 0.64$), and state worry ($t(94) = 2.68$, $p < .009$, $d = .55$) than participants in the self-immersion condition. In partial support of hypothesis 2b, participants in the self-compassion condition reported significantly less event-specific worry ($t(87) = 3.83$, $p < .001$, $d = .82$) and state anxiety ($t(89) = 2.45$, $p = .016$, $d = .52$) than the self-distancing condition, but not significantly less state worry ($p > .05$, $d = .31$).

STUDY 1: DISCUSSION

Contrary to our expectations, participants in the self-distancing condition did not report significantly less event-specific worry, state anxiety, and state worry compared to participants in the self-immersion condition. This finding contrasts existing research that frames linguistic distancing (over immersion) as an adaptive strategy when processing thoughts and emotions in response to an anxiety-provoking situation (Kross et al., 2014; White et al., 2019). Yet, in support of hypothesis 2a, participants in the self-compassion condition reported significantly less event-specific worry, state anxiety, and state worry than participants in the self-immersion condition. As such, generating self-compassion appears to transform how individuals relate to self-relevant future experiences. Indeed, promoting self-compassion through writing has been argued to help individuals relate to potential threats in ways that does not promote worrisome thinking (Brooker et al., 2019; Harwood & Kokovski 2017). In contrast, self-immersion has previously been considered to resemble individuals' default perspective when engaging with content that may generate uncomfortable thoughts and emotions, thus explaining why prior work have omitted neutral control conditions and solely relied on immersion as a comparison group (White et al., 2019). Lastly, in partial support of hypothesis 2b, participants in the self-compassion condition reported significantly less event-specific worry and state anxiety than the self-distancing condition. Notably, the effect size of the state worry mean change scores between the two conditions fell within the small to moderate range even though the result did not reach statistical significance. Thus, while this is the first study to evaluate self-distancing and self-compassion concurrently, the present findings suggest that self-compassion in particular may offer an effective strategy to change how

individuals relate to their experience in response to future threats. To build upon these findings, study 2 utilized an almost identical approach, but examined the efficacy of the interventions using a national sample.

STUDY 2: METHOD

Participant

After IRB approval was obtained (#18-0532), a total of 178 participants took part in the study. Data cleaning mirrored the approach of Study 1. The process yielded an analytical sample of 145 MTurk participants ($N_{females}$ = 69; M_{age} = 38.42; SD_{age} = 11.73).

Procedure

We restricted participation to MTurkers who currently live in the United States, are at least 18 years old, fluent in English, and able to type using a computer keyboard. Participants were asked to complete the survey in one sitting, in a quiet environment without distraction. After selecting into the study on MTurk, participants received a link that included the informed consent and the online survey via Qualtrics. Study 2 utilized identical task procedures as Study 1. Upon completion, participants were compensated $4.00 for their time and effort, a rate consistent with other psychological studies of similar length on MTurk. Unique codes generated by Qualtrics that are matched with MTurk IDs using embedded data served to identify participants for compensation procedures. The completion code was then entered into their MTurk account after which MTurk distributed their payment.

Measures

Participants answered the same set of questionnaires used in Study 1. In the current study, baseline and post-intervention Cronbach's alpha for the STAI-S were 0.65 and 0.66, respectively. With regard to the CWI, baseline and post-intervention Cronbach's alpha were 0.94 and 0.95, respectively. In addition to assessing the socio demographic variables from study 1, participants in this adult sample answered questions

pertaining to their occupational role(s) and experiences. Specifically, they were asked to indicate the average number of work hours each week, their job tenure, and their type of occupation using standard codes from O*Net, an online job analysis platform (see Appendix C). Additionally, participants responded to a single question inquiring about their level of absenteeism (# of times over the last two months).

STUDY 2: STATISTICAL ANALYSES

Data cleaning procedures and statistical analyses mirrored those from Study 1. Initially, 178 participants selected into the study, but 24 participants exited the study during the initial set of questionnaires (yet prior to notification of their condition assignment) and were consequently not included in the analyses. Participants who wrote less than 200 characters in their qualitative responses to the prompts ($N = 4$) and participants whose IRV was lower than two standard deviations from the sample's mean IRV ($N = 1$) were also excluded from the analyses. We also examined participants' qualitative responses to minimize the potential threat of bots on MTurk and to identify those who did not follow instructions. Participants who failed to follow instructions (e.g., copied/pasted instructions, wrote nonsense words) were excluded ($N = 4$) and/or those who missed more than 20% of the items on the CWI and/or STAI-S ($N = 0$). Thus, a total of nine participants ($N_{SI} = 2$, $N_{SD} = 2$, $N_{SC} = 5$) were excluded from the analyses, yielding an analytic sample of 145 participants.

Like in Study 1, data were analyzed with IBM SPSS software (version 26) using descriptive statistics, independent sample t-tests, chi square, and repeated measures ANOVA. The sociodemographic characteristics of the sample are presented in Table 6. The three conditions were comparable at baseline on all demographic variables (i.e., age, gender, race, all *p*s>.05, see Table 6) and there were also no statistically significant differences between the three groups in baseline measures (VAS, CWI, STAI-S) and trait measures (PSWQ, SCS, STAI-T).

All the manipulation check items yielded statistically significant differences between the three groups: SI (X^2 (6, $N = 145$) = 39.42, $p < .001$), SD (X^2 (6, $N = 145$) =

68.33, $p < .001$), and SC (X^2 (6, N = 144) = 28.17, $p < .001$). Specifically, a majority of participants estimated using condition-consistent linguistic markers "a moderate amount" or "a lot": In the SI condition, 91% indicated having used first-person pronouns (versus 43% in SD and 60% in SC), in the SD condition, 83% indicated having used non-first-person pronouns (versus 14% in SI and 38% in SC), and in the SC condition, 85% indicated having used compassionate language (versus 43% in SI and 50% in SD).

STUDY 2: RESULTS

First, three repeated measures ANOVAs were conducted to assess whether participants' event-specific worry (VAS), state anxiety (STAI-S), and state worry (CWI) differs by condition using separate analyses for each dependent variable. Results revealed significant change in event-specific worry ($F(2,142) = 8.34$, $p < .001$) and state anxiety ($F(2,142) = 8.51$, $p < .001$) as a function of condition (see Table 7 for pre-/post-intervention *M*s and *SD*s). Analysis did not yield a main effect for state worry or a state worry by condition interaction ($p > .05$).

Next, follow-up independent samples t-tests for two of the three outcome variables (i.e., event-specific worry and state anxiety) were conducted to further examine the significant interaction term of each repeated measure ANOVA. Prior to that, assumptions of equality of error variance as indicated by Levene's test (*p*s > .05) were examined and adjusted accordingly (i.e., equal variances were not assumed if $p < .05$). The difference change scores for all three conditions were calculated by subtracting each of the three baseline scores from each of the three post-intervention scores (e.g., state anxiety Time 2 – state anxiety Time 1), with negative mean scores suggesting a decrease from Time 1 to Time 2, and a positive mean score reflecting an increase from Time 1 to Time 2. Contrary to our hypothesis 1, participants in the self-distancing condition did not report significantly less event-specific worry and state anxiety, *p*s > .05 than participants in the self-immersion condition (see Tables 8-10). In partial support of hypothesis 2a, participants in the self-compassion condition reported significantly less event-specific worry ($t(96) = 3.61$, $p < .001$, $d = .74$) and state anxiety ($t(96) = 3.67$, $p < .001$, $d = .75$) than participants in the self-immersion condition. In partial support of hypothesis 2b,

participants in the self-compassion condition reported significantly less event-specific worry ($t(85) = 3.13$, $p = .003$, $d = .68$) and state anxiety ($t(85) = 3.29$, $p = .001$, $d = .71$) than the self-distancing condition.

STUDY 2: DISCUSSION

To build upon Study 1, study 2 recruited participants through MTurk to examine the efficacy of the writing interventions in a national U.S. adult sample. Generally, the findings closely mirrored the ones observed with undergraduate student participants in Study 1. However, the three conditions in the MTurk sample did not significantly differ with regard to their mean change score of state worry, which led us to focus on the remaining two outcomes, event-specific worry and state anxiety, when examining between group differences. In contrast to hypothesis 1, participants in the self-distancing condition did not report significantly less event-specific worry and state anxiety than participants in the self-immersion condition. Similar to the results of Study 1, this finding also seems inconsistent with work highlighting the adaptive role of linguistic distancing in the context of future threats (Kross et al., 2014; White et al., 2019). Moreover, participants in the self-compassion condition reported significantly less event-specific worry and state anxiety than the self-immersion and self-distancing condition, therefore providing partial support for hypothesis 2a and b**.** This finding parallels work that has illustrated the promising effects of self-compassion in helping individuals respond more adaptively to anxiety-provoking situations (Brooker et al., 2019; Harwood & Kokovski 2017).

GENERAL DISCUSSION

Drawing upon the transdiagnostic framework (Frank & Davidson, 2014), the intolerance of uncertainty model (Dugas et al., 2001; Koerner & Dugas, 2006), and acceptance-based models (e.g., Hayes et al., 2012, Roemer & Orsillo, 2005), the objective of the present work was to examine whether a brief writing intervention integrating self-distancing or self-compassion can aid two non-clinical samples, an undergraduate student sample (Study 1) and a U.S. national adult sample (Study 2), relate to a self-identified future threat in ways that mitigate state worry, event-specific worry, and state anxiety. According to the transdiagnostic framework (Frank & Davidson, 2014), being intolerant of uncertainty has previously been termed a transdiagnostic (cognitive) vulnerability mechanism and worry has been conceptualized as a response mechanism (Frank & Davidson, 2014). Consistent with acceptance-based frameworks, rather than worrying, different strategies (e.g., self-distancing and self-compassion) have been proposed to be adaptive as individuals attempt to escape unpleasant experiences and affective reactions associated with uncertain situations perceived as threatening. As such, the present work intended to examine whether two of these strategies can shift how individuals relate to self-relevant threats as suggested by decreases in worry and anxiety.

In both studies, participants in the self-distancing condition did not report significantly lower scores on any of the outcome measures compared to the self-immersion condition, which does not align with existing work highlighting the benefits associated with linguistic distancing (Kross et al., 2014; White et al., 2019). Prior work has measured event-specific worry in response to a standardized speech task (Kross et al., 2014, Study 4) or examined changes in anxiety between conditions after participants took

part in a laboratory social interaction task (Kross et al., 2014, Study 2), which may function differently than the standardized ones previously used. Similarly, Kross et al. (2017) examined the effect of self-distancing on participants' worry as it pertained to the Ebola pandemic without assessing perceived self-relevance of the threat (and relatively low baseline worry). Additionally, other studies have asked participants to identify a self-referential threat, but examined aspects of individuals' experiences different from the present work. Specifically, participants who wrote about a "current source of social anxiety" using distanced language appraised it as less threatening (and more challenging), but the authors did not evaluate affective outcomes (Kross et al., 2015, Study 5). Similarly, White and colleagues (2019) asked participants to think about a specific future stressor from their assigned perspective, but measured anxiety as part of an emotional reactivity composite score along with other markers of affect (e.g., happiness) and intensity of affect. Given these considerations, this was the first study that examined previously unexamined outcomes in the context of a self-relevant future threat, and therefore reflects both a partial replication and an extension of prior work.

Statistically speaking, it is notable that effect sizes for all three pre- to post-outcome measures in the self-distancing condition were negligible. Consistent with prior work utilizing participants' perceived use of distanced versus immersed language as a manipulation check (e.g., Kross et al., 2014, Study 2; White et al., 2019), participants in the self-distancing condition endorsed having used more distanced language than participants in the self-immersion condition. While it is possible that participants' perception of their language (pronoun) use did not accurately reflect their actual language use, and thus may explain our null findings, Kross et al. (2017) demonstrated that even if

language use is systematically measured using a text analysis program, it does not necessarily suggest a direct impact on affect-related outcomes, which is consistent with the results of our work. Specifically, in Kross et al. (2017), participants in the distanced condition used significantly more distanced language in their written responses and such change enabled participants to generate more fact-based reasons not to worry (which in turn predicted lower post-intervention worry), but the language use did not directly change participants' Ebola worry. As such, it is possible that mere change in language use may not be the mechanism by which people successfully change how they relate their affective experiences in the context of self-referential threats.

In light of these considerations, distancing or "defusing" from thoughts may be necessary but not sufficient in changing aversion to intense emotions and experiential avoidance. Indeed, acceptance-based frameworks such as ACT (e.g., Hayes et al., 2012) propose multiple components that shift negative emotional appraisals. Among them, a mechanism other than defusion may be needed to change how individuals appraise future situations (e.g., positively or neutrally appraising uncertainty). For instance, self-compassion has been associated with less catastrophizing (Leary et al., 2007) and reductions in trait- and event-specific worry (Brooker et al., 2019; Smeets et al., 2014), all of which may suggest that self-compassion can change how individuals relate to and appraise their experiences. Indeed, compassion may be one factor that complements the "space" established through distancing via the avenues of self-kindness toward their discomfort and a sense of common humanity.

Prior work on self-compassion suggests that it incorporates aspects of acceptance through its three components: mindfulness, self-kindness, and common humanity (Neff

2003a). Generating distance from one's emotions fosters awareness and mindful objectivity, which enables individuals to acknowledge that life's challenges (including uncertainty pertaining to future events) are a shared human experience. For example, writing compassionately about a past mistake has been shown to ameliorate anticipatory anxiety in socially anxious individuals exposed to a social stressor (Harwood & Kokovski, 2017) suggesting that normalizing as part of self-compassion can lessen threat appraisal of self-relevant stressors. Openly responding to suffering, inadequacy or failure with warmth, kindness, and non-judgmental understanding promotes acceptance of common internal experiences. Consistent with this theoretical framework and prior empirical findings, across both studies, the present work provided initial support to the notion that responding to self-relevant future threats in a self-compassionate manner can mitigate worry and anxiety.

Theoretical and Practical Implications

Taken together, the present work offers notable theoretical and practical implications. Using infrequently studied outcome measures in a novel self-referential context, we advance prior research by providing a broader understanding of the relationships between transdiagnostic vulnerability and response mechanisms (Frank & Davidson, 2014), thus expanding the nomological network of the constructs examined. We make a meaningful contribution by drawing connections between two lines of work: the distancing literature which has primarily relied on a cognitive research base, and self-compassion, which is informed by acceptance-based frameworks. Namely, we consider distancing through the lens of acceptance-based approaches, which understand self-as-observer as part of a larger interconnected network of strategies enabling individuals to

defuse from aversive internal experiences. To further build on this, we examine the potential benefits of a self-compassion orientation beyond the self-as-observer perspective, and identify it as a promising avenue to transform negative emotional appraisals. Notably, by isolating a cognitive strategy and examining the intersection of cognitive and affective mechanisms in the context of self-compassion, we are contributing to a growing effort to identify component interventions (Franke & Davidson, 2014) meant to improve the effectiveness and efficiency of mental health care.

Furthermore, our findings illustrate the potential benefit of using a brief, scalable, and cost-effective writing intervention to help individuals relate more effectively to perceived threats. Specifically, existing interventions that integrate aspects from acceptance-based approaches are not always feasible, as many are limited by factors including cost, time demands/duration, and access, all of which can interfere with individual participation (Economides et al., 2018; Shapira & Mongrain, 2010; Smeets et al., 2014). Equally concerning, self- or public stigma can act as major obstacles undermining treatment seeking or care utilization (e.g., Schnyder et al., 2017, Sickle et al., 2019). If individuals decide to seek out care, services are not always available and/or may be delayed. As such, it is crucial to enhance the accessibility of quality care, to which the present work made a meaningful contribution. Using two non-clinical voluntary samples of adults, the present work demonstrated that writing compassionately for less than five minutes can successfully shift affective and cognitive ways of responding to self-relevant threats.

While participants in study 1 completed the intervention using a computer in the research laboratory, study 2 illustrated that a national sample of adults taking part in our

remote intervention reported experiencing benefits that mirrored those reported by participants in study 1. As such, this study builds upon a growing body of remotely-delivered interventions (Economides et al., 2018; Bakker et al., 2019) to increase accessibility. Additionally, the present intervention may represent a cost-effective, appropriately targeted option for individuals who may not reach levels of distress that prompt them to seek out in-person care (i.e., those with greater tolerance of uncertainty and lower levels of worry/subclinical levels of symptom presentation). Furthermore, the sample characteristics of both studies may suggest that the benefits of these interventions may be generalizable to a wide variety of individuals and to different types of self-referential future situations and their associated aversive responses.

Limitations and Other Future Directions

Consistent with prior work (e.g., Harwood & Kurkoski, 2017; Kross et al., 2017; Przezdziecki & Sherman, 2016), the present study examined the outcomes of interest immediately following the writing intervention. To our knowledge, this is the first study to demonstrate the immediate benefits following a three-minute self-compassion writing intervention as other studies have asked participants to write for at least 15 minutes (Leary et al., 2014; Seekis et al., 2018; Ziemer et al., 2018) and/or for multiple times (e.g., daily; Shapira & Mongrain, 2010). While this suggests that much shorter, single-time interventions may be effective, it remains uncertain how long the observed changes in the present work persisted and how they would compare to in-person and/or longer interventions. However, it is important to recognize that direct comparisons may not be completely appropriate given the use of different outcome measures in each of these studies. For example, Smeets et al. (2014) illustrated that increases in self-compassion

following a three-week, three-session self-compassion meditation training predicted changes in trait-based worry one week following the last intervention session.

With regard to writing interventions, individuals who took part in a week-long, daily self-compassion writing condition showed significantly greater reductions in depressive symptoms at three months and significantly greater increases in happiness at three and six months, compared to a control condition (Shapira & Mongrain, 2010). Additionally, Seekis et al., (2018) demonstrated that a sample of female undergraduate students participating in a 15-minute self-compassion writing intervention (versus a control group) reported higher state body appreciation, but not lower appearance-related anxiety at a two-week follow-up measurement. To build upon the present findings, it would be worthwhile to examine the long-term effects of brief writing interventions, potentially integrating experience sampling methodologies to better capture timing or persistence of momentary changes in internal experiences.

Additionally, future research should further explore the underlying processes that conferred the promising changes observed in the present work. Specifically, we relied on the theoretical and empirical basis of transdiagnostic and acceptance-based frameworks (e.g., Frank & Davidson, 2014; Hayes et al., 1999; Roemer & Orsillo, 2005) to propose that a self-compassion writing intervention may increase tolerance of aversive experience. Consistent with this line of reasoning, it would be valuable to measure actual changes in participants' intolerance of uncertainty (Carleton, Norton, & Asmundson, 2007) and experiential avoidance (Bond et al., 2011) in the context of the present work, as these may offer an explanation for the underlying mechanisms at play. Similarly, self-compassion is primarily conceptualized as a personality disposition or tendency,

consistent with its trait-level characterization in the self-compassion measure (Neff, 2003) commonly used in prior work. However, intervention research has argued that self-compassion is a malleable skill and its changes affect other important psychosocial outcomes (for a recent meta-analysis, see Ferrari et al., 2019). In light of these considerations, one potential avenue would be to examine changes in each of the three components of self-compassion. Additionally, given some of the inconsistencies observed between the results of the present work and those in extant literature, qualitative examination of the content of self-relevant worries may offer additional insight into potential mediators or moderators of the studied relationships.

Furthermore, one of our outcome measures, the CWI, evidenced inconsistent relationships between the different conditions, and compared to the other outcomes studied in both samples. This pattern of results suggests that this measure might not have adequately detected the presence of momentary worry. Considering the static relationship across all conditions even over time may suggest that the CWI may not be sensitive to momentary changes in worry, thus calling for the development of a validated, more state-sensitive worry measure.

Lastly, the present study exclusively focused on reducing maladaptive responses to unpleasant internal experiences by assessing potential decreases in anxiety and (event-specific/state) worry. While not the focus of the present study, future research should consider examining indicators of positive affective change as done in prior work (e.g., Smeets et al., 2014; Ziemer et al., 2018). Such effort would be consistent with the theoretical underpinnings of acceptance-based frameworks that (1) do not necessarily aim to reduce but rather change how individuals relate to unpleasant emotional experiences

(e.g., anxiety, depression, etc.) and (2) recognize that changes in positive responses to internal experiences (e.g., acceptance, satisfaction, meaning) may not necessarily mirror changes in negative responses.

TABLES

Table 1. *Sociodemographic and Baseline Differences by Condition*

	Self-immersion $N = 47$		Self-distancing $N = 49$		Self-compassion $N = 42$		F	p
	M	SD	M	SD	M	SD		
Age	20.6	2.77	20.36	2.17	20.09	2.07	.5	.605
VAS T1	62.17	22.79	68.83	23.93	67.76	21.95	1.12	.328
STAI-S T1	45.94	16.9	47	15.07	47.94	14.44	.2	.819
CWI T1	19.57	9.06	19.5	9.18	20.27	8.15	.11	.897
SCS	74.74	21.24	78.48	17.98	78.49	16.82	.62	.542
PSWQ	53.87	16.25	53.07	15.58	55.76	14.12	.38	.688
STAI-T	43.51	12.02	43.95	11.4	44.57	10.92	.1	.901
	N		N		N		X^2	p
Gender							5.86	.439
Female	24		27		30			
Male	23		15		17			
Other	0		0		2			
Race							14.96	.381
White	27		17		23			
Black/ African-American	7		10		13			
Hispanic, Latino/a, Spanish	4		4		8			
Asian	5		5		1			
Native Hawaiian/ Pacific Islander	1		0		0			
Bi-/Multi racial	3		4		2			
Other	0		2		2			

Note. $N_{Total} = 138$; Other (Gender/Race) includes participants who chose not to respond. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index, SCS = Self-Compassion Scale, PSWQ = Penn State Worry Questionnaire, STAI-T = State-Trait Anxiety Inventory, T1 = Time 1 (Pre-intervention)

Table 2. *Repeated Measures ANOVA, Study 1*

	Time	Self-immersion $N = 47$	Self-distancing $N = 42$	Self-compassion $N = 49$	F	p
		M (SD)	M (SD)	M (SD)		
VAS ($df = 134$)	Pre	62.17 (22.79)	68.83 (23.93)	67.76 (21.95)		
	Post	62.45 (24.01)	66.63 (27.07)	51.86 (23.13)		
	Cohen's *d*	-.01	0.09	.71		
Time					17.24	<.001
Group					1.39	.252
Time x Group					13.56	<.001
STAI-S ($df = 135$)	Pre	45.94 (16.90)	47.00 (15.07)	47.94 (14.44)		
	Post	45.09 (16.54)	45.45 (16.42)	41.14 (12.75)		
	Cohen's *d*	.05	.1	.5		
Time					15.17	<.001
Group					.15	.859
Time x Group					5.92	.003
CWI ($df = 135$)	Pre	19.57 (9.06)	19.50 (9.18)	20.27 (8.15)		
	Post	19.98 (8.83)	18.52 (9.84)	17.06 (8.29)		
	Cohen's *d*	-.05	.1	.39		
Time					5.21	.024
Group					.226	.798
Time x Group					3.81	.024

Note. [a]$N = 41$ for VAS only. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index

Table 3. *Independent Samples t-Test Comparing SI and SD, Study 1*

	Self-immersion (SI) N = 47	Self-distancing (SD) N = 42[a]	*t*	*p*	*d*
	M_{Diff} (SD)	M_{Diff} (SD)			
VAS	.28 (13.62)	-1.93 (14.61)	.73	ns	.16
STAI-S	-.85 (6.99)	-1.55 (8.88)	.41	ns	.09
CWI	.40 (4.42)	-.98 (5.95)	1.25	ns	.27

Note. [a]N = 41 for VAS only. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index; d = Cohen's d

Table 4. *Independent Samples t-Test Comparing SD and SC, Study 1*

	Self-distancing (SD) N = 42[a]	Self-compassion (SC) N = 49	*t*	*p*	*d*
	M_{Diff} (SD)	M_{Diff} (SD)			
VAS	-1.93 (14.61)	-15.90 (19.97)	3.83*	<.001	.82
STAI-S	-1.55 (8.88)	-6.80 (11.18)	2.45	<.02	.52
CWI	-.98 (5.95)	-3.20 (8.28)	1.45	ns	.31

Note. *Levene's Test for Equality of variance was significant ($p < .05$). Equal variances not assumed. [a]N = 41 for VAS only. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index; d = Cohen's d

Table 5. *Independent Samples t-Test Comparing SI and SC, Study 1*

	Self-immersion (SI) N = 47	Self-compassion (SC) N = 49	*t*	*p*	*d*
	M_{Diff} (SD)	M_{Diff} (SD)			
VAS	.28 (13.62)	-15.90 (19.97)	4.65*	<.001	1.01
STAI-S	-.85 (6.99)	-6.80 (11.18)	3.11	.002	.64
CWI	.40 (4.42)	-3.20 (8.28)	2.68*	.009	.55

Note. *Levene's Test for Equality of variance was significant ($p < .05$). Equal variances not assumed. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index; d = Cohen's d

Table 6. *Sociodemographic and Baseline Differences by Condition, Study 2*

	Self-immersion N = 58		Self-distancing N = 47		Self-compassion N = 40		*F*	*p*
	M	SD	M	SD	M	SD		
Age	37.03	10.51	39.85	12.09	38.75	13	.77	.466
SCS	84.24	22.61	79.28	23.2	84.13	22.44	.74	.478
PSWQ	46.91	16.89	49.94	17	48.83	16.94	.43	.652
STAI-T	39.9	12.6	42.15	13.98	41.78	12.97	.44	.643
VAS T1	70.33	22	74.96	24.23	71.93	23.97	.52	.595
STAI T1	46.88	16.32	50.57	16.37	50.78	15.61	.96	.386
CWI T1	18.79	8.43	21.57	8.8	18.5	8.88	1.79	.171
	N		N		N		X^2	*p*
Gender							5.63	.465
Female	24		24		21			
Male	33		23		18			
Other	1		0		1			
Race							3.13	.926
White	44		36		33			
Black/ African-American	5		3		3			
Hispanic, Latino/a, Spanish	4		2		2			
Asian	4		5		2			
Bi-/Multi racial	1		0		0			

Note. N_{Total} = 145; Other (Gender) includes participants who chose not to respond. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index, SCS = Self-Compassion Scale, PSWQ = Penn State Worry Questionnaire, STAI-T = State-Trait Anxiety Inventory, T1 = Time 1 (Pre-intervention)

Table 7. *Repeated Measures ANOVA, Study 2*

	Time	Self-immersion (SI) N = 58	Self-distancing (SD) N = 47	Self-compassion (SC) N = 40	*F*	*p*
		M (SD)	M (SD)	M (SD)		
VAS (*df* = 142)	Pre	70.33 (22.00)	74.96 (24.23)	71.93 (23.97)		
	Post	69.69 (23.46)	72.49 (27.13)	58.50 (27.44)		
	Cohen's *d*	.03	.1	.52		
Time					16.94	<.001
Group					1.45	.238
Time x Group					8.34	<.001
STAI-S (*df* = 142)	Pre	46.88 (16.32)	50.57 (16.37)	50.78 (15.61)		
	Post	46.79 (15.61)	49.81 (17.05)	43.38 (13.99)		
	Cohen's *d*	.01	.05	.5		
Time					12.71	<.001
Group					.73	.484
Time x Group					8.51	<.001
CWI (*df* = 142)	Pre	18.79 (8.43)	21.57 (8.80)	18.50 (8.88)		
	Post	20.21 (8.89)	21.60 (9.25)	17.05 (7.96)		
	Cohen's *d*	-.16	-.003	.17		
Time					.00	.99
Group					2.62	.08
Time x Group					1.58	.21

Note. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index

Table 8. *Independent Samples t-Test Comparing SI and SD, Study 2*

	Self-immersion (SI) N = 58	Self-distancing (SD) N = 47	*t*	*p*	*d*
	M_{Diff} (SD)	M_{Diff} (SD)			
VAS	-.64 (16.18)	-2.47 (12.74)	.63	ns	.12
STAI-S	-.09 (8.87)	-.77 (7.91)	.41	ns	.08
CWI	1.41 (8.02)	.02 (7.90)	.89	ns	.18

Note. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index; d = Cohen's d

Table 9. *Independent Samples t-Test Comparing SD and SC, Study 2*

	Self-distancing (SD) N = 47	Self-compassion (SC) N = 40	*t*	*p*	*d*
	M_{Diff} (SD)	M_{Diff} (SD)			
VAS	-2.47 (12.74)	-13.43 (18.73)	3.13*	.002	.77
STAI-S	-.77 (7.91)	-7.4 (10.87)	3.29	.001	.71
CWI	.02 (7.90)	-1.45 (7.61)	.88	ns	.19

Note. *Levene's Test for Equality of variance was significant ($p < .05$). Equal variances not assumed. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index; d = Cohen's d

Table 10. *Independent Samples t-Test Comparing SI and SC, Study 2*

	Self-immersion (SI) N = 58	Self-compassion (SC) N = 40	*t*	*p*	*d*
	M_{Diff} (SD)	M_{Diff} (SD)			
VAS	-.64 (16.18)	-13.43 (18.73)	3.61	<.001	.74
STAI-S	-.09 (8.87)	-7.4 (10.87)	3.66	<.001	.75
CWI	1.41 (8.02)	-1.45 (7.61)	1.77	ns	.36

Note. VAS = Visual Analogue Scale Event-Specific worry, STAI-S = State-Trait Anxiety Inventory - State, CWI = Current Worry Index; d = Cohen's d

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APPENDIX A: EXPERIMENTAL MANIPULATION INSTRUCTIONS

1) Identification of Future Threat (same across all conditions and studies)

Please read the instructions below carefully!

No matter how satisfied people are with their lives, there are times that they worry and experience anxiety about things that may go wrong or things that may happen.

Take a few moments right now to think about an event or situation that you worry about happening to you.

For example, this could be worrying about your performance at school or work, your (or a family member's) health, your relationships, finances, or other potential concerns. As you do this, try to identify a future event or situation that you think about regularly, that makes you feel especially anxious whenever you think about it, and that may significantly impact your life.

Although it may be difficult, most people can usually come up with at least one event or situation that stands out and that they regularly worry about.

Take your time as you try to do this and please continue below whenever you have identified an event you worry about.

2) Brief Description of Self-Identified Threat (same across all conditions and studies)

We just asked you to identify an event or situation that you worry about happening to you. In 1-2 sentences, please describe the event or situation you have just identified.

3a) Self-Immersion Condition - Writing Prompt

Next, we will ask you to write about your thoughts and experiences using the instructions below. Please read carefully! Please make sure to use the event or situation you just identified when following the instructions:

One of the things we are interested in in this study is to understand how individuals process their worries. Some people try to make sense of their feelings by thinking about the event from their own perspective. For example, they may ask themselves “Why am I feeling this way? What are the underlying causes and reasons for my feelings?"

Call to mind the worry-provoking event or situation that you just identified. Now imagine the event unfold through your own eyes as if it were happening to you. Try to understand the causes and reasons for your worries as you think about the event or situation. Ask yourself – "Why do I have these feelings?"

Please write about your feelings and thoughts associated with the worry-provoking event or situation using “I” and “me”. Take your time to really understand why you are worried about the event or situation. Again, address yourself using "I" and "me" as you write down and reflect on thoughts and feelings that emerge in response to the worry-provoking event you identified.

Once you have read the instructions, please advance to the next page. To fully understand your experiences, we will ask you to write for at least 3 minutes (and a minimum of 200 characters) following the instructions above. The instructions will be redisplayed when you advance.

[Advance to the next page]

To fully understand your experiences, we ask you to write for at least 3 minutes (and a minimum of 200 characters) following the instructions above. To make this easier for you, we have set a timer so you cannot advance until after 3 minutes.

Following the instructions, please start writing now and write until the advance button appears! We do not focus on grammar or spelling!

3b) Self-Distancing Condition - Writing Prompt

Next, we will ask you to write about your thoughts and experiences using the instructions below. Please read carefully! Please make sure to use the event or situation you just identified when following the instructions:

One of the things we are interested in in this study is to understand how individuals process their worries. Some people try to make sense of their feelings by thinking about the event from an observer perspective. For example, they may ask themselves “Why are you or why is he/she feeling this way?”. If their name is Jane, they may ask "Why is Jane feeling this way?" What are the underlying causes and reasons for her feelings?

Call to mind the worry-provoking event or situation that you just identified. Now imagine moving away from the event or situation to a point where you can now watch the experience unfold from a distance. Try to understand the causes and reasons for your worries as you think about the event or situation. Ask yourself – “Why do you have those feelings?”

Please write about your feelings and thoughts associated with the worry-provoking event or situation using “you”, “he/she”, or your own name. Take your time to really understand why you are worried about the event or situation. Again, address yourself

using "you", "he/she", or your own name as you write down and reflect on thoughts and feelings that emerge in response to the worry-provoking event you identified.

Once you have read the instructions, please advance to the next page. To fully understand your experiences, we will ask you to write for at least 3 minutes (and a minimum of 200 characters) following the instructions above. The instructions will be redisplayed when you advance.

[Advance to the next page]

To fully understand your experiences, we ask you to write for at least 3 minutes (and a minimum of 200 characters) following the instructions above. To make this easier for you, we have set a timer so you cannot advance until after 3 minutes.

Following the instructions, please start writing now and write until the advance button appears! We do not focus on grammar or spelling!

3c) Self-Compassion Condition - Writing Prompt

Next, we will ask you to write about your thoughts and experiences using the instructions below. Please read carefully! Please make sure to use the event or situation you just identified when following the instructions:

One of the things we are interested in in this study is to understand how individuals process their worries. Some people try to acknowledge their difficult thoughts and feelings, adopt a compassionate, non-judgmental perspective, telling themselves that they are not alone, and that others might experience similar worries. For example, they may ask themselves “What words do I need to hear to feel soothed and what would I tell a friend who may be feeling this way?”.

Call to mind the worry-provoking event or situation that you just identified. Now imagine seeing the event from a place of compassion for yourself. Try to express understanding and be kind to yourself as you think about the event or situation. Ask yourself – "What do I need to hear to feel soothed and what would I tell a friend who may have those feelings?"

Please write about your feelings and thoughts associated with the worry-provoking event or situation using words of kindness. Take your time to really express understanding for the worries you experience and imagine that others might experience similar worries. Again, address yourself using words of kindness as you write down and reflect on any thoughts and feelings that emerge in response to the worry-provoking event you identified.

Once you have read the instructions, please advance to the next page. To fully understand your experiences, we will ask you to write for at least 3 minutes (and a minimum of 200 characters) following the instructions above. The instructions will be redisplayed when you advance.

[Advance to the next page]

To fully understand your experiences, we ask you to write for at least 3 minutes (and a minimum of 200 characters) following the instructions above. To make this easier for you, we have set a timer so you cannot advance until after 3 minutes.

Following the instructions, please start writing now and write until the advance button appears! We do not focus on grammar or spelling!

APPENDIX B: EXPLORATORY MEASURES

Self-esteem. The 10-item Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) was used to examined participants' self-esteem using a scale from 1 (strongly agree) to 4 (strongly disagree). Five items are reverse scored. On a continuous scale, higher scores indicate higher self-esteem. An example item includes "I feel that I have a number of good qualities". Research has demonstrated the measure's excellent internal consistency ($\alpha = .92$) as well as excellent test-retest reliability over a period of 2 weeks (Rosenberg, 1979).

Decentering. The 13-item Toronto Mindfulness Scale (TMS; Lau et al., 2006) is a state measure of mindfulness. Thus, the TMS differs from other preexisting measures capturing trait mindfulness. The scale incorporates two factors: Curiosity and decentering. While curiosity capture's participant's desire to learn more about their experiences (i.e., I am curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings or sensations"), decentering entails awareness of one's experiences "with some distance and disidentification" (Lau et al., 2006, p. 1452, "I experience myself as separate from my changing thoughts and feelings"). Using a scale from 0 (not at all) to 4 (very much), the item scores of each subscale are totaled to yield a final score for each factor. Validation studies have demonstrated internal consistency alphas of .88 (Curiosity) and .84 (Decentering). In support of the measure's construct validity, TMS factor scores were found to increase following a mindfulness-based stress reduction program. For the purpose of this study, only the decentering factor will be examined.

Emotion regulation. The 10-item Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was used to measure participants' tendency to regulate their emotions using cognitive reappraisal and expressive suppression. Cognitive reappraisal entails that participants reinterpret a potentially emotion-eliciting situation and change its emotional impact whereas suppression refers to the inhibition of emotionally expressive behavior (Gross & John, 2003). Example items include "I control my emotions by changing the way I think about the situation I'm in" (reappraisal) and "I control my emotions by not expressing them" (suppression). The measure's internal consistency averaged .79 for reappraisal and .73 for suppression and the test–retest reliability across 3 months was .69 for both scales. In support of the measure's convergent validity, suppression was positively related to inauthenticity and negatively related to coping through venting (Gross & John, 2003). In contrast, reappraisal was positively related to coping through reinterpretation.

Perceived stress reactivity. The 23-item, self-report Perceived Stress Reactivity Scale (PSRS; Schlotz, Yim, Zoccola, Jansen, & Schulz, 2011) was used to measure an individual's tendency to respond to potentially stressful scenarios. Three ordered options of responses are provided. For example, "When I have to speak in front of other people . . .", I often get very nervous (0); I often get somewhat nervous (1); In general, I stay calm (2). Cronbach's alphas suggest adequate internal consistency. Items pertaining to similar stressors can be combined to compute situation-specific scale scores (perceived reactivity to work overload; $\alpha = 0.77$, perceived reactivity to social conflicts; $\alpha = 0.71$, perceived reactivity to failure; $\alpha = 0.65$, perceived reactivity to social evaluation; $\alpha = 0.63$ and prolonged reactivity; $\alpha = 0.62$) or aggregated to yield an overall score of perceived stress

reactivity (PSRS total score; α = 0.85). Test-retest reliability analysis in a U.S. sample yielded medium to high stability of the PSRS scores over a 4-week period. Additionally, convergent validation analysis supported expected associations with related constructs such as self-efficacy, neuroticism, chronic stress, and perceived stress.

Generalized anxiety. The 7-item, self-report Generalized Anxiety Disorder 7 measure (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) was used to assess respondents' experience and potential severity of generalized anxiety symptoms. While the measure can be used to screen for Generalized Anxiety Disorder, it should not be used as a sole assessment tool (Kertz, Bigda-Peyton, & Bjorgvinsson, 2013). Previous factor analyses supported a unidimensional factor structure (Spitzer et al., 2006). Psychometric properties indicated excellent internal consistency (α = .92) and temporal stability was shown to be present across one week (r = .83). In support of the construct validity of the scale, the measure correlated positively with the Beck Anxiety Inventory (r = .72; Kertz et al., 2013) as well as the Penn State Worry Questionnaire (r = .64; Kertz et al., 2013).

Affect. The 10-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess participants' momentary affect. Participants completed this measure along with the primary outcome measures before and after the intervention.

Likelihood of Event. Consistent with previous work (White et al., 2018), participants' perception of the likelihood of their selected event was measured with the item, "I believe that this event is very likely to happen in the future."

Estimated Impact of Event. To control for differences in severity/estimated impact of participants' self-selected stressor, a single-item measure was administered prior to the intervention. For exploratory purposes, group differences in estimated impact after the intervention were examined as well.

The following four measures were modified from previous work (White et al., 2018)

Emotional reactivity. Consistent with previous work (White et al. 2018), two items were used to assess negative affect during the experimental manipulation: "Thinking about the situation I worry about in this study made me feel negatively (e.g., anxious, nervous, apprehensive)" and "As I wrote about the situation I worry about, my emotions and physical reactions to this future concern were intense". Scores on the two items were combined to create an index of emotional reactivity.

Imagery vividness. Following previous work (White et al., 2018), imagery vividness was measured with two items: "My imagination of my worry was clear and vivid" and "The experience felt real, as if it were really happening to me, when I imagined the situation during the study". Item scores were combined and averaged to create an index of imagery vividness.

Self-efficacy. Participants rated their self-efficacy regarding coping with their future concern using "If I were to face the situation tomorrow, I could handle it well.

Thought content measure. As done by White et al. (2018), a total of four items were used to assess participant's balance between the two types of thought content described above – recounting and reconstrual. Specifically, "My thoughts focused on the specific chain of events (e.g., sequence of events that would unfold, what can really

happen; what I would say, feel, or do) as I wrote about this future situation" was the item used to measure recounting whereas reconstrual was assessed with the following three items: "As I imagined and thought about this future experience during the study, I had a realization that led me to experience a sense of closure about my fears and concerns about this event," "As I imagined and thought about this future experience during the study, I had a realization that caused me to think differently about it," and "Thinking about the future event during the study led me to have a clearer and more coherent understanding of my emotions surrounding the possibility of this event." The reconstrual score was then subtracted from the recounting score to assess the balance between the two types of thought content. Higher scores reflected a predominance of recounting.

APPENDIX C: O*NET CODES

You will see 23 occupations listed below. Please choose the broad occupation type that best corresponds with your current job. On the next page, you will see a set of sub-categories to choose from based on the occupation you select here.

If you are retired, please refer to your last job/occupation (prior to retirement).

1. Management Occupations
2. Business and Financial Operations Occupations
3. Computer and Mathematical Occupations
4. Architecture and Engineering Occupations
5. Life, Physical, and Social Science Occupations
6. Community and Social Service Occupations
7. Legal Occupations
8. Educational Instruction and Library Occupations
9. Arts, Design, Entertainment, Sports, and Media Occupations
10. Healthcare Practitioners and Technical Occupations
11. Healthcare Support Occupations
12. Protective Service Occupations
13. Food Preparation and Serving Related Occupations
14. Building and Grounds Cleaning and Maintenance Occupations
15. Personal Care and Service Occupations
16. Sales and Related Occupations
17. Office and Administrative Support Occupations
18. Farming, Fishing, and Forestry Occupations

19. Construction and Extraction Occupations

20. Installation, Maintenance, and Repair Occupations

21. Production Occupations

22. Transportation and Material Moving Occupations

23. Military Specific Occupations

Please choose the category that best describes your job. These appear based on the answer you provided to the broad occupation question on the previous page.

If you are retired, please refer to your last job/occupation (prior to retirement).

- Top/Chief Executives
- Advertising, Marketing, Promotions, Public Relations, and Sales Managers
- Operations Specialties Managers
- Other Management Occupations
- Business Operations Specialists
- Financial Specialists
- Computer Occupations
- Mathematical Science Occupations
- Architects, Surveyors, and Cartographers
- Engineers
- Drafters, Engineering Technicians, and Mapping Technicians
- Life Scientists
- Physical Scientists
- Social Scientists and Related Workers
- Life, Physical, and Social Science Technicians

- Occupational Health and Safety Specialists and Technicians
- Counselors, Social Workers, and Other Community and Social Service Specialists
- Religious Workers
- Lawyers, Judges, and Related Workers
- Legal Support Workers
- Postsecondary Teachers
- Preschool, Elementary, Middle, Secondary, and Special Education Teachers
- Other Teachers and Instructors
- Librarians, Curators, and Archivists
- Other Educational Instruction and Library Occupations
- Art and Design Workers
- Entertainers and Performers, Sports and Related Workers
- Media and Communication Workers
- Media and Communication Equipment Workers
- Healthcare Diagnosing or Treating Practitioners
- Health Technologists and Technicians
- Other Healthcare Practitioners and Technical Occupations
- Home Health and Personal Care Aides; and Nursing Assistants, Orderlies, and Psychiatric Aides
- Occupational Therapy and Physical Therapist Assistants and Aides
- Other Healthcare Support Occupations
- Supervisors of Protective Service Workers

- Firefighting and Prevention Workers
- Law Enforcement Workers
- Other Protective Service Workers
- Supervisors of Food Preparation and Serving Workers
- Cooks and Food Preparation Workers
- Food and Beverage Serving Workers
- Other Food Preparation and Serving Related Workers
- Supervisors of Building and Grounds Cleaning and Maintenance Workers
- Building Cleaning and Pest Control Workers
- Grounds Maintenance Workers
- Supervisors of Personal Care and Service Workers
- Animal Care and Service Workers
- Entertainment Attendants and Related Workers
- Funeral Service Workers
- Personal Appearance Workers
- Baggage Porters, Bellhops, and Concierges
- Tour and Travel Guides
- Other Personal Care, Childcare, and Service Workers
- Supervisors of Sales Workers
- Retail Sales Workers
- Sales Representatives, Services/Agents
- Sales Representatives, Wholesale and Manufacturing
- Other Sales and Related Workers

- Supervisors of Office and Administrative Support Workers
- Communications Equipment Operators
- Financial Clerks
- Information and Record Clerks
- Material Recording, Scheduling, Dispatching, and Distributing Workers
- Secretaries and Administrative Assistants
- Other Office and Administrative Support Workers
- Supervisors of Farming, Fishing, and Forestry Workers
- Agricultural Workers
- Fishing and Hunting Workers
- Forest, Conservation, and Logging Workers
- Supervisors of Construction and Extraction Workers
- Construction Trades Workers
- Helpers, Construction Trades
- Other Construction and Related Workers
- Extraction Workers
- Supervisors of Installation, Maintenance, and Repair Workers
- Electrical and Electronic Equipment Mechanics, Installers, and Repairers
- Vehicle and Mobile Equipment Mechanics, Installers, and Repairers
- Other Installation, Maintenance, and Repair Occupations
- Supervisors of Production Workers
- Assemblers and Fabricators
- Food Processing Workers

- Metal Workers and Plastic Workers
- Printing Workers
- Textile, Apparel, and Furnishings Workers
- Woodworkers
- Plant and System Operators
- Other Production Occupations
- Supervisors of Transportation and Material Moving Workers
- Air Transportation Workers
- Motor Vehicle Operators
- Rail Transportation Workers
- Water Transportation Workers
- Other Transportation Workers
- Material Moving Workers
- Military Officer Special and Tactical Operations Leaders
- First-Line Enlisted Military Supervisors
- Military Enlisted Tactical Operations and Air/Weapons Specialists and Crew Members