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Development and evaluation of a computerized intervention for low distress tolerance and its effect on performance on a neutralization task

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ABSTRACT

Background and objectives: A growing body of research has linked high distress intolerance (DI) to obsessions, but not other OCD symptom domains. However, existing research is correlational. Experimental studies are needed, but brief methods for reducing DI are lacking. To address these gaps in the literature, a brief, computerized intervention aimed at reducing DI was developed to determine if changing DI affected obsessional phenomena.

Methods: Individuals reporting high DI were randomized to a treatment or waitlist control group ($N = 53$). Individuals in the treatment group received the DI treatment (i.e., a 2 h computerized intervention) over two weeks, and then underwent a post-assessment in which DI and obsession-relevant phenomena were measured. Individuals in the control group only received the post-assessment.

Results: Analyses revealed a greater reduction in self-reported DI on one measure and smaller decreases in behavioral DI in the intervention condition relative to the waitlist condition, as well as lower in-vivo urges to neutralize an intrusive thought; however, anxious reactivity to the intrusion and neutralization behavior were not affected. Further, bootstrapping analyses revealed that reductions in DI mediated the effect of the intervention on neutralization urges.

Limitations: A clinical sample and placebo control condition were not used.

Conclusions: These results provide experimental evidence for the role of DI in obsessional phenomena, specifically in affecting urges to neutralize intrusions, findings consistent with negative reinforcement models of DI. Further, results revealed that DI can be reduced with a brief, computerized intervention, which has important implications for future experimental research and treatment development.

1. Introduction

Distress intolerance (DI), an individual difference variable reflecting the ability to experience and tolerate aversive emotional states, is theorized to be a transdiagnostic emotional vulnerability factor (Leyro, Zvolensky, & Bernstein, 2010) related to disorders across the internalizing and externalizing spectrums (Zvolensky, Leyro, Bernstein, & Vujanovic, 2011). On a symptom level, high DI appears to be particularly associated with obsessions (Robinson & Freeston, 2014).

In a series of studies using non-clinical samples, Cougle, Timpano, Fitch, and Hawkins (2011) found high DI to be concurrently and prospectively predictive of obsessions, but not other OC symptoms, after controlling for negative affect. Additionally, in a separate non-clinical sample, only obsessions were associated with greater self-reported and behaviorally-indexed DI (Cougle, Purdon, Fitch, & Hawkins, 2013; Cougle, Timpano, Sarawgi, Smith, & Fitch, 2013). In another non-clinical sample, DI was found to interact with the tendency to behave rashly when upset (i.e., negative urgency; Cyders & Smith, 2008) to predict greater obsessional symptoms, even after controlling for negative affect and dysfunctional worry (Cougle, Timpano, & Goetz, 2012). Finally, Macatee, Capron, Schmidt, and Cougle (2013) utilized a longitudinal methodology in a non-clinical sample and found that daily stressful events were associated with greater obsessions, but only among individuals with high DI. Further, this relationship was

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independent of trait-level negative affect. Additionally, the authors found that, though OCD diagnosis was not associated with greater DI, obsessional symptoms specifically were significantly associated with DI, even after controlling for co-occurring depressive symptoms. In summary, across non-clinical and clinical samples, higher DI has been linked to greater obsessions, and this relationship does not appear to be accounted for by covariates also linked to DI (i.e., negative affect, pathological worry).

Indirect evidence for the role of DI in obsessions can also be gleaned from a treatment study. Whittal, Woody, McLean, Rachman, and Robichaud (2010) found stress management training (SMT) to be as effective as cognitive therapy in the treatment of obsessions, though SMT has been previously found to be ineffective for OCD samples with heterogenous symptom presentations (Lindsay, Crino, & Andrews, 1997; Simpson et al., 2008), suggesting that SMT may only be efficacious for OCD patients characterized as 'pure obsessionals.' Given the focus of SMT, it is possible that obsessional symptoms were decreased via increases in patients' ability to cope with and tolerate distress. Indeed, prominent theories of obsessions have identified catastrophic misinterpretations of internal stimuli (e.g., anxiety-related sensations/thoughts) and avoidant coping strategies as more characteristic of 'pure obsessionals' relative to other OCD subtypes (Lee & Kwon, 2003; Rachman, 1998). Given that DI is defined by heightened perceptions of threat from internal, affective stimuli together with the propensity to immediately remove such stimuli (McHugh & Otto, 2012), it is plausible that SMT's focus on exposure to distress and its adaptive management reduced patients' DI, resulting in decreased misinterpretations of internal stimuli and avoidant coping, thus improving obsessional symptoms. However, DI was not measured and so mediation analyses to address this possibility could not be conducted.

There are a number of gaps in the research on obsessions and DI that remain to be addressed. First, though two studies have examined the relationship between DI and obsessions over time (Cougle et al., 2011; Macatee et al., 2013), all studies addressing this relationship have been correlational. Experimental studies assessing the potential causal role of DI in obsessions are needed. Second, though Whittal et al. (2010) utilized an experimental design to test the effect of a stress management intervention on obsessions, they did not measure DI and so the effects of the intervention cannot necessarily be attributed to changes in DI. Treatment studies are needed that explicitly assess DI as a mechanism of change. Third, experimental research has been limited by the lack of established methods for reducing DI. Bornovalova, Gratz, Daughters, Hunt, and Lejuez (2012) found a six-session group treatment to be effective at decreasing DI, and did so without a focus on specific domains (e.g., nicotine withdrawal symptoms; Brown et al., 2008), instead attempting to target the construct more generally. However, because of the number of components, it is difficult to determine which elements of the intervention are most important to changing DI. Development of a brief, computerized intervention would enhance understanding of the DI construct and help clarify the active ingredient by which it is changed. Further, such an intervention would be useful for guiding future DI experimental research and treatment development.

The following study was conducted to address the aforementioned gaps in the literature, and three hypotheses were formed. First, we sought to develop and evaluate the efficacy of a novel brief, computerized intervention aimed at decreasing DI in vulnerable individuals. To guide intervention design, we examined a recent factor analysis of different emotional tolerance constructs that derived the items most reflective of the core DI construct (McHugh & Otto, 2012). Derived items primarily reflected negative affective responses to distress and strong action tendencies to immediately reduce distress. The intervention was composed of two modules to target both domains, in line with the structure of a similar brief intervention for anxiety sensitivity (AS) (Keough & Schmidt, 2012), a construct theoretically and empirically related to DI (Mitchell, Riccardi, Keough, Timpano, & Schmidt, 2013). Because DI has been assessed with both self-report and behavioral measures (McHugh & Otto, 2011; Simons & Gaher, 2005), both forms of assessment were included to test intervention efficacy. We predicted that the computerized intervention would be more effective at decreasing DI across self-report and behavioral measures relative to a wait-list control group.

Second, it was important to test the effect of the intervention on obsessions. We predicted that, relative to the wait-list condition, the computerized intervention would decrease anxiety, neutralization urges, and neutralization behavior in response to an intrusive, distressing thought elicited in the lab. Finally, we predicted that reductions in DI would mediate the effect of condition on anxiety, neutralization urges, and neutralization behavior in response to an intrusive thought.

2. Material and methods

2.1. Participants

After obtaining IRB approval of the study design, participants were recruited from a large southeastern university and invited to participate based upon their Distress Tolerance Scale (DTS; Simons & Gaher, 2005) scores, with lower scores indicating greater DI. If an individual scored in the bottom 20th percentile, they were invited to participate in the study. Twenty-seven participants were assigned to the DI treatment condition and 26 participants were assigned to the waitlist control condition. The total sample was predominantly Caucasian (75.5%), though African-American (9.4%), Hispanic (9.4%), Asian (3.8%), and other (1.9%) ethnicities were represented as well. See Table 2 for additional demographic data.

2.2. Procedure

After being recruited, participants provided informed consent and were randomized to a treatment condition or waitlist control, with those in the treatment condition returning to the lab once a week for two weeks to complete both sessions of the intervention. All participants completed a baseline questionnaire battery and a behavioral measure of DI and returned to the lab for a post-assessment appointment three weeks following baseline to complete the same measures. Further, during the post-assessment, participants completed a neutralization task assessing in-vivo response to an intrusive thought.

2.3. Materials

2.3.1. DI intervention

In line with the factor analytic findings of McHugh and Otto (2012) and prior intervention development for related risk factors (e.g., Keough & Schmidt, 2012), we developed a two session computerized intervention composed of two modules aimed at decreasing DI in vulnerable individuals.

To reduce negative affective responses to distress, the first module was composed of psychoeducation on the adaptive and useful functions of negative emotions and the negative long-term consequences of avoidance of negative emotional experience. Psychoeducation was presented with audio/video examples and interactive components to maximize interest and attention. Further, a quiz with feedback was presented to ensure comprehension of the material.