



A novel method for assessing distress intolerance: Adaptation of a measure of willingness to pay

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ABSTRACT

Background and Objectives: Distress intolerance is a core element of many models of psychopathology and is related to a range of disorders and maladaptive behaviors. However, research on distress intolerance has been hampered by inconsistency in its assessment. Moreover, recent perspectives suggest that distress intolerance varies based on the domain of distress, highlighting the need for a measure that can capture intolerance across types of distress. This paper introduces a novel measure for distress intolerance: an adaptation of the willingness to pay (WTP) measure, which provides a consistent metric for assessing distress intolerance across domains of distress.

Methods: The WTP Distress Intolerance (WTP-DI) measure was administered to two samples of participants and feasibility and validity were evaluated.

Results: Evidence from unselected and clinical samples provide evidence for the feasibility and discriminant and concurrent validity of this measure.

Limitations: Testing WTP-DI in larger samples and across additional domains of distress is needed.

Conclusions: The WTP-DI measure provides a new measure of distress intolerance that addresses the primary limitations of existing measures and has potential to serve as a cross domain measure to facilitate comparison across types of distress.

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1. Introduction

Distress intolerance (DI) is defined as the perceived inability to withstand distressing states and is hypothesized to be a central element of many psychological disorders (see for review [Leyro, Zvolensky, & Bernstein, 2010](#)). DI is hypothesized to amplify these states ([McHugh et al., in press](#); [Zvolensky & Otto, 2007](#)), thereby increasing motivation for avoidance-based coping strategies, such as agoraphobic avoidance (e.g., [White, Brown, Somers, & Barlow, 2006](#)), substance use (e.g., [Kushner, Thuras, Abrams, Brekke, & Stritar, 2001](#)), and self-injury (e.g., [Nock & Mendes, 2008](#)) that may contribute to disorder onset and maintenance. Accordingly, many cognitive-behavioral treatments target the reduction of DI (e.g., [Brown et al., 2008](#); [Hayes, Strosahl, & Wilson, 1999](#); [Linehan, 1993](#); [Otto, Safren, & Pollack, 2004](#)). Despite the importance of assessing DI to both research and clinical agendas, there currently is no consensus regarding its measurement, and existing measures are limited by few validation studies, low shared variance across measures, and a failure to account for the potential variability in

tolerance based on the type of distress. In this article, we propose a novel strategy for assessing DI that provides a single metric for measurement across varied domains.

1.1. Issues in DI assessment

Recent evidence has suggested that DI is distress domain-specific, or varies based on the type of distress (e.g., [McHugh & Otto, in press](#); [Sirota et al., 2010](#)). For example, [McHugh et al. \(in press\)](#) evaluated the shared variance among DI measures and found that behavioral measures that induced emotional distress (e.g., frustration) were strongly associated with each other, but were not associated with those that induced somatic distress (e.g., pain). Moreover, there was evidence for method variance, with self-report and behavioral measures sharing little variance, even within similar domains. The domain-specificity of DI underscores the need for measures that are applicable across types of distress in order to facilitate comparisons across distress domains as well as across populations and studies. However, current self-report measures treat distress as a unitary construct or focus on one type of distress (e.g., frustration). Likewise, behavioral measures are limited by their induction of only one type of distress as well as other determinants of persistence (e.g., motivation).

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The assessment of DI is subject to the same challenges as measures of emotion regulation. Aldao, Nolen-Hoeksema, and Schweizer (2010) highlighted three particular problems with such measurement that, with only subtle changes, can be applied to DI: (1) the ability to report on one's perceived ability to tolerate distressing states requires awareness of both one's own distress and response to distress; (2) DI is very closely tied to the experience of the distress itself and thus distinguishing between the nature and intensity of distress and one's tolerance may be particularly challenging; and (3) there is potential for shared item content between emotional symptoms and DI items.

The purpose of this paper is to describe a novel strategy for the assessment of DI that can be utilized across distress domains and that circumvents many of the challenges to designing measures of emotion regulation. We describe an adaptation of the widely used willingness to pay (WTP) measure from economic research for the measurement of DI.

1.2. Willingness to pay

Several methods are available in economics for evaluating the utility of non-market goods, resources, and services. One value elicited in such methods is an individual's willingness to pay for the outcome of interest. WTP provides a metric for the evaluation of individual or group perceptions of utility in hypothetical scenarios for which such data would otherwise be difficult or impossible to attain (e.g., Arrow et al., 1993; Portney, 1994). For example, in psychology, this method has been applied to the burden of disease and valuation of treatment for conditions such as depression (Morey, Thacher, & Craighead, 2007) and schizophrenia (Lang, 2005). Among methods for elicited WTP values, the contingent valuation method (CVM) or stated-preference model involves asking respondents to identify the value that they would hypothetically be willing to pay. CVM can also elicit other values, such as willingness to accept—or the highest value at which a respondent would accept a particular outcome.

The administration format (interview, self-report) and content (yes/no, actual monetary responses) of measures of WTP varies across studies with pros and cons associated with various methods of administration. Overall, WTP has demonstrated favorable validity (e.g., Foreit & Foreit, 2003; Philips, Whynes, & Avis, 2006) and reliability (e.g., Foreit & Foreit, 2003; Loomis, 1990; Kealy, Montgomery, & Dovidio, 1990; Teisl, Boyle, McCollum, & Reiling, 1995).

Applications of WTP provide information about individual and group valuation of goods and services that may be difficult to measure because they lack a meaningful metric. By extension, WTP may provide an index of the value of tolerating versus avoiding/removing distress.

1.3. Adapting willingness to pay

The WTP measure addresses two of the major limitations of existing DI measures by (1) providing a flexible method that balances the benefit of behavioral measures (e.g., the ability to measure *in vivo* reaction to distress) with the benefit of self-report measures (e.g., the lessened contribution of confounding factors such as demand characteristics or other motivations to continue a distressing task) and (2) providing a consistent metric that can be utilized across types of distress and across investigations to facilitate comparison. The same WTP questions can be applied to any type of somatic (e.g., pain, respiratory discomfort) or emotional (e.g., anxiety, frustration, sadness) distress domain. Self-report measures could also capture levels of DI across types of distress; however, assessing a range of types of distress in a self-report

measure would result in a particularly lengthy measure and would not capture *in vivo* response to distress.

This format also circumvents some of the major challenges of measuring emotional variables by (1) requiring less emotional awareness because respondents are rating their valuation of removing a state rather than describing the state or their response to it, (2) asking specifically about the value of removing an experience, thus minimizing confusion with rating the intensity of the experience itself, and (3) not sharing item content with measures of the experience of distress.

We developed an adapted version of WTP for distress intolerance (WTP-DI; see Appendix). This measure assesses how much a respondent would be willing to pay to avoid distress following the induction of that distressing state.¹ Items use a forced-choice format in which participants chose from several monetary values expressed as proportion of monthly income (0% to >15% of monthly income). This measure was designed to be utilized following the elicitation of a distressing state in order to evaluate *in vivo* response to these states and to provide the participant with a context for determining ratings. Thus, the wording of the measure was designed such that it could be applied to any type of distress. Proportion of monthly income was selected as the metric to minimize the impact of income on responding, consistent with previous studies (Damschroder, Ubel, Riis, & Smith, 2007).² Although in previous applications of WTP in mental illness (e.g., estimating WTP to remove depression; Morey, Thatcher, & Craighead, 2007) actual dollar value elicited is meaningful, in this application, we focus on *relative* WTP values. In other words, we conceptualize the units of WTP as important relative to differences between groups and between distress domains within individuals.

Below we describe two studies utilizing the WTP-DI with the aim of evaluating the feasibility and utility of such measurement relative to other measures of DI.

2. Study 1

The WTP-DI measure was administered to 39 participants who were enrolled in a study examining the association between affect and eating behaviors in overweight individuals. Rates of measure completion and respondent ease of use ratings were used to assess feasibility of use of the measure. In addition, convergent and discriminant validity was assessed by the correlations between WTP-DI and self-report and behavioral indices of DI.

For this initial investigation, completion rates higher than 90% and a majority of favorable ratings (at least slightly easy) on a scale of ease of use were considered support for measure feasibility. We hypothesized that the WTP-DI would exhibit concurrent validity with self-report and a behavioral persistence DI measures as evidenced by correlations reflecting a medium effect size or larger ($r \geq .24$). As this study employed two mood inductions (frustration and sadness), we hypothesized that these correlations would be

¹ This version of WTP-DI could also be adjusted with respect to the time period of interest. We have experimented with various time periods in initial versions and did not find reliable differences. We prefer this current version because it is the clinical conceptualization that best characterizes syndromes (i.e., behaviors initiated to avoid the development or maintenance of a distressing state).

² One concern traditionally in the application of WTP is that the "payment card" format (such as that used in this study, where responses are framed for the participant) may constrain the WTP values through the use of pre-determined values. Specifically, a frame that is overly narrow limits the ability to detect significant individual or group differences. However, given that we were able to detect such differences suggest that our frames are broad enough so that important individual differences were captured.

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