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The Drexel defusion scale: A new measure of experiential distancing

Evan M. Forman*, James D. Herbert, Adrienne S. Juarascio, Peter D. Yeomans, John A. Zebell, Elizabeth M. Goetter, Ethan Moitra

Department of Psychology, Drexel University, 15th and Race, Philadelphia, PA 19106, USA

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ABSTRACT

Defusion, the ability to achieve psychological distance from internal experiences such as thoughts and feelings, is considered to be a key mechanism of cognitive behavior therapy and is particularly emphasized in certain acceptance-based behavior therapies like mindfulness-based cognitive therapy and acceptance and commitment therapy (ACT). Unlike other treatment components such as cognitive restructuring, however, defusion has been less well studied as a potential mediator of change. One reason for this lack of attention is the absence of a well-validated measure of defusion. Current measures confound defusion with other related, yet distinct, constructs such as psychological acceptance or mindful awareness. One challenge in measuring defusion is that the meaning of the construct is not readily apparent to respondents. The current study reports on a new measure, the Drexel defusion scale (DDS), by providing information about its development, reliability, and validity. Results from several samples indicate that the measure is unidimensional, with good internal consistency. The DDS is highly correlated with measures of acceptance and decentering, suggesting high convergent validity. Higher scores on the DDS are also associated with less psychopathology and a higher quality of life, even after controlling for measures of similar constructs, indicating that the DDS provides incremental validity beyond existing measures. Additionally, among a treatment-seeking sample, increases in the DDS were associated with improvements in psychological functioning, for both those receiving ACT and CT treatment. The DDS appears to be a reliable and valid measure of defusion.

0. Introduction

Defusion refers to a state of mind wherein one achieves psychological distance from subjective experiences, seeing them merely as psychological events or states rather than as literal, truth-based interpretations of reality (Blackledge, 2007; Masuda, Hayes, Sackett, & Twohig, 2004). In the literature on acceptance and commitment therapy (ACT), the term defusion, and its counterpart fusion, are most commonly used to refer to one's psychological relationship with respect to verbal/cognitive processes (Hayes, Strosahl, & Wilson, 2012). From a technical standpoint, cognitive fusion is a natural byproduct of language processes that occurs when verbal descriptions (i.e., thoughts, evaluations of physical or emotional experiences) of a possible, external reality come to acquire the same properties of the external event these verbal evaluations describe (Eifert & Forsyth, 2011). In a broader sense, the concept of defusion can also be applied to other subjective experiences, such as emotions, sensations, or memories (Forman & Herbert, 2009; Herbert & Forman, 2011; Orsillo & Batten, 2002). Similar constructs, under various labels, has been posited by a number of scholars to be a key mechanism of various forms of cognitive behavior therapy (CBT). Despite the centrality of defusion to several models of CBT, the concept has received less attention than other treatment components such as restructuring maladaptive cognitions or enhancing mindful awareness of distressing thoughts and feelings. In addition, although several existing measures tap related constructs, most confound defusion with other factors such as psychological acceptance. The current paper aims to describe various constructs that are closely linked to defusion, review existing measures of these constructs, and describe the development and initial validation of a new measure of defusion.

1. Distancing

Cognitive therapy (CT) is based on the premise that dysfunctional thinking is an important contributor to psychopathology (Beck, 1993; Dobson, 2001). Cognitive therapists therefore focus on helping patients identify their thoughts, assess them for accuracy, usefulness, or both, systematically identify cognitive distortions, and restructure their thoughts and beliefs accordingly to be more realistic and functional. The initial step in this process, sometimes referred to as "distancing," is the ability to step back

* Corresponding author. Tel.: +215 762 4021. fax.: +215 762 8625.
E-mail address: Evan.forman@drexel.edu (E.M. Forman).

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from one's thoughts and to see them as mental events rather than as necessarily accurate reflections of reality (Beck, 1993).

Although distancing is a necessary prerequisite for cognitive restructuring, the process has traditionally received less attention in CT relative to treatment components focused on directly changing cognitive content. However, several streams of evidence suggest that distancing may in fact play a critical role in the effectiveness of CT. In fact, some scholars have even suggested that distancing may be more important in CT than cognitive disputation and restructuring. For instance, Ingram and Hollon (1986) may have been prescient in suggesting that the effectiveness of CT hinges on teaching patients to switch from an "automatic" mode of cognitive processing to a "metacognitive" one. Empirical evidence for this notion includes (Barber & DeRubeis' 1989) mediational findings, which led them to conclude that CT operates not by directly impacting dysfunctional cognitions but by helping patients develop "second thoughts" in response to their initial cognitions.

2. Meta-cognitive awareness and decentering

The meta-cognitive construct was further explicated by Teasedale and colleagues. In a study of CT for prevention of relapse of major depression, the *form* of patients' responses to depression-related cognition items predicted relapse, but their agreement with the *content* of those items did not (Teasdale et al., 2001). Teasdale and colleagues further theorized that CT may facilitate a shift in cognitive set from "identifying personally with negative thoughts and feelings" to relating "to negative experiences as mental events in a wider context or field of awareness" (Teasdale et al., 2002, p. 276). They labeled this shift "decentering." In addition, they suggested that through such decentering, patients achieve "metacognitive awareness," which is defined as "the cognitive set in which negative thoughts and feelings are seen as passing mental events rather than as aspects of self" (Teasdale et al., 2002, p. 277). Teasdale and his colleagues developed a form of CBT known as mindfulness-based cognitive therapy (MBCT), the aim of which was to further the development of metacognitive awareness. Evidence from comparative trials of MBCT and standard CT suggest that both therapies exerted their effects by means of increasing metacognitive awareness (Teasdale et al., 2002, 2000). Despite subtle theoretical differences, it is not clear if the concepts of decentering and mindfulness are empirically distinct (Carmody, Baer, Lykins, & Olendzki, 2009; Sauer & Baer, 2010).

3. Metacognitive model

Whereas Teasdale discussed meta-cognition in relation to depression, (Wells, 1999, 2007) has formulated a metacognitive model of anxiety. In this model, positive beliefs about worry and rumination (e.g., "worrying will help me stave off catastrophic consequences") are implicated in the pathogenesis and maintenance of anxiety disorders. Teasdale et al., 2002 have pointed out an important distinction between their metacognitive construct, which they term metacognitive *insight*, and that of Wells, which they term metacognitive *knowledge.* Meta-cognitive insight refers to "the way mental phenomena are experienced as they arise" and "experiencing thoughts as thoughts (that is, as events in the mind rather than as direct readouts on reality) in the moment they occur" (Teasdale et al., 2002, p. 286). Metacognitive knowledge "refers to beliefs about cognitive phenomena stored in memory as propositional facts in much the same way as other facts…Such propositional beliefs are potentially open to the evaluation procedures traditionally used in CT" (Teasdale et al., 2002, p. 286). Despite these differences, Wells (2007) similarly invokes the concepts of "detached mindfulness" which includes the development of meta-awareness (consciousness of one's thoughts) and cognitive "de-centering" (realization that thoughts may or may not be "facts"). An effective treatment approach for a variety of disorders, Metacognitive Therapy, has been developed based on these ideas.

4. Mindfulness

The concept of mindfulness has recently received increasing attention among both researchers and clinicians. Although there is no consensus on a single definition of mindfulness, the description offered by Kabat-Zinn (1994) is frequently cited: "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (p. 4). Herbert and Cardaciotto (2005) note that the various conceptualizations of mindfulness all combine two distinct constructs: ongoing awareness of one's experience, and a nonjudgmental perspective toward that experience (Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008). Mindfulness plays a central role in several recent models of CBT, including mindfulness-based stress reduction (Kabat-Zinn et al., 1992), mindfulness-based cognitive therapy (Segal, Williams, & Teasdale, 2002), dialectical behavior therapy (Linehan, 1993), relapse prevention (Witkiewitz & Marlatt, 2004) and ACT (Hayes et al., 2012). Although the concept of mindfulness moderately overlaps with that of defusion, the two may in fact be distinguished. Mindfulness involves a heightened awareness of both internal and external experience, and a specific attitude or perspective of nonjudgmentalness and compassion toward that experience. In contrast, the concept of defusion is more limited in scope, focusing on the psychological distancing from one's experience.

5. Cognitive defusion

In contrast to the incidental increase of distancing achieved by standard CT, Zettle and Hayes (1986) made achieving greater psychological distance from dysfunctional thoughts the centerpiece of an approach they termed "comprehensive distancing" (Zettle, 2005). This approach eventually evolved into a multidimensional model of CBT known as acceptance and commitment therapy (ACT; Hayes et al., 2012), and a more refined notion of distancing termed cognitive defusion. As noted above, cognitive defusion refers to the process by which thoughts are viewed as simply thoughts rather than absolute truths, and thus the disabling function of such a thought is interrupted (Blackledge, 2007). Clinically, defusion is the ability to step back from or distance oneself from one's subjective experience in a manner that enables patients to see that their thoughts are "just thoughts" that need not be believed nor disbelieved (Hayes, 2004; Wilson & Roberts, 2002). As individuals begin to experience their thoughts less literally – observing them as just thoughts – they are able to respond in a manner consistent with chosen values rather than reacting to thoughts, worries, or sensations (Eifert et al., 2009). The goal of defusion is to help individuals relate differently to internal, private experiences, including not just thoughts, but also feelings and memories (Orsillo & Batten, 2002). Thus, although defusion implies distance from verbal events (i.e., thoughts), other private experiences – such as feelings and memories, (which are experienced physically and emotionally, as well as verbally) – can also be targets of defusion. Within the ACT model, cognitive defusion is linked with a perspective of nonjudgmental acceptance toward experience, thereby

permitting one to behave independently of distressing thoughts, feelings, and physical sensations. Thus, a patient with social phobia who sees his thought "she thinks I'm a loser" as merely a collection of words supplied by his anxious brain is less likely to be distressed by the thought and more likely to be able to approach another person and initiate a conversation even while simultaneously having the thought. Moreover, this thought begins to become less entangled with associated private experiences like shame, embarrassment, self-consciousness, and memories of past humiliations. This process is similar to the notion of challenging the believability of the thought in CT. However, unlike CT, ACT generally makes no direct effort to assess the truth value of the thought or to modify it in any way. Whereas defusion is commonly discussed with respect to cognition, we suggest that the concept can be applied to all psychological events, including pain sensations, cravings, distressing memories, and emotions (Herbert & Forman, 2011). For example, a person who is highly fused with her anxiety might experience the anxiety as an overwhelming and self-effacing emotion, whereas a person who is well defused from her experience of anxiety would experience the sensations from a psychological distance, and might think simply "at this moment I am having the feeling of anxiety." A number of ACT exercises exist to help patients learn to defuse from distressing experiences, such as encouraging description of thoughts and feelings in real time and in language that emphasizes the fact that the individual is a person having thoughts and feelings as opposed to simply being immersed in and entangled with the experience (e.g., "right now I am having the thought 'she is laughing at me'").

6. Existing measures of related constructs

No measure of defusion as a global construct has yet been developed. However, several measures of related constructs are in use.

Awareness and coping in autobiographical memory: The Measure of Awareness and Coping in Autobiographical Memory (MACAM; Moore, Hayhurst, & Teasdale, 1996) presents eight mildly depressing situations via audiotape and asks respondents to imagine themselves in these situations. Interviewers then elicit and discuss (using a semi-structured interview) memories that have been piqued by these vignettes. The respondents' descriptions of these memories are taped and later coded for level of meta-cognitive awareness, from one ("minimal discrimination of different negative thoughts and feelings—being immersed in undifferentiated bad feelings") to five ("persistent or extensive distancing from thoughts and feelings") (Teasdale et al., 2002, pp. 277–278). Strengths of this program include the use of an analog mood-induction technique that increases ecological validity, and the fact that metacognitive awareness is determined by expert rating rather than by self-report. On the other hand, use of the measure requires extensive training of interviewers/raters and it is time-consuming to administer, making it impractical for use in most settings. In addition, interrater reliability is modest at best, and internal reliability is unknown partly due to the technique's failure to invoke memories on many occasions. Construct validity was established only to the extent that the measure differentiated previously-depressed and never-depressed individuals. Moreover, the measure is confined to depressive cognition.

Experiences questionnaire: Fresco et al., 2007 have developed and evaluated a self-report measure of decentering, defined as "the ability to observe one's thoughts and feelings as temporary, objective events in the mind, as opposed to reflections of the self that are necessarily true" (p. 234). The measure, which they named the Experiences Questionnaire (EQ), consists of two subscales, Decentering and Rumination. The Decentering Subscale was designed to measure "changes assumed to occur in MBCT" (p. 236), including the ability to view one's self as not synonymous with one's thoughts, the ability not to habitually react to one's negative experiences, and the capacity for self-compassion.

The Experiences Questionnaire scale proved to have good reliability and validity, though several exploratory and confirmatory factor analyses did not confirm the two-factor model. Also, the Decentering subscale appears to extend beyond a focused definition of decentering/defusion. This notion is confirmed by the authors' own definition: "measuring the changes assumed to occur in MBCT, *including* decentering" (Fresco et al., 2007, p. 236, emphasis added). Although the authors sought to separate their construct theoretically from mindful awareness, several of the items appear to tap this notion explicitly, e.g., "I have the sense that I am fully aware of what is going on around me and inside me." In addition, the authors include "the capacity for self-compassion" as a facet of decentering, and include several items related to this construct in the scale, such as "I can treat myself kindly." It is not clear how these items are linked to the core construct.

Meta-cognitions questionnaire: The meta-cognition questionnaire (Cartwright-Hatton & Wells, 1997) is a 65-item scale designed to measure the following five domains of metacognition: positive beliefs about worry, negative beliefs about thoughts related to uncontrollability, cognitive confidence in attention and memory, negative beliefs about the consequences of not controlling thoughts, and cognitive self-consciousness. The first four factors resemble Teasdale's concept of metacognitive knowledge, and in this way differ from metacognitive awareness. The last seems similar to metacognitive awareness on the surface, but the scale is conceived of as a pathologic *over*-focus on thoughts and not on developing an adaptive distance from one's thoughts. Both the original scale, and a shorter, 30-item version, have good psychometric properties. One limitation of the scale is its exclusive focus on worry beliefs. Also, it appears to combine several interrelated constructs, and thus measures metacognition very broadly. Moreover, it is a measure of metacognitive knowledge rather than metacognitive awareness.

A few measures have also been developed that measure the construct of believability, or how much an individual "buys into" his or her thoughts.

Automatic thoughts questionnaire—believability: Zettle and Hayes (1986) created a measure of the believability of cognitions by modifying the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980). The original measure requires respondents to rate the frequency with which they experience 30 depression-linked thoughts. In addition to these frequency ratings, Zettle and Hayes (1986) also asked respondents to rate the degree to which they *believed* each of the 30 thoughts, and called this subscale the ATQ-believability (ATQ-B). ATQ-B showed greater declines in patients randomized to a "comprehensive distancing" therapy than those randomized to several other interventions including traditional CT. The scale has had relatively little use over the years, and appears to suffer from a number of shortcomings. One shortcoming is that the statements on the ATQ and ATQ-B are specific to depression. Moreover, Hayes and colleagues' descriptions of defusion suggest that it is not equivalent to the believability of thoughts. Moreover, the psychometrics of the scale, including its validity, are unknown. For instance, at least according to post-hoc study data from our group, participants may not be able to distinguish between ratings of believability and frequency (correlations above 0.90).

Believability of anxious feelings and thoughts: The believability of anxious feelings and thoughts (Herzberg et al. (in press)) assesses the perceived validity of certain thoughts and feelings related to anxious experiences. Individuals rate different statements about anxiety on a scale from 1 (not at all believable) to 7 (completely believable). The BAFT has demonstrated good discriminant validity

(between clinically anxious and non-anxious individuals), good test–retest reliability, and high convergent and divergent validity. The authors report that this is a viable tool for measuring fusion with anxious internal experiences. Although the BAFT represents the closest measures of defusion and early reports suggest it has good psychometric properties, the measure has a few notable limitations. First, its applicability for use with nonanxious clinical groups is not clear due to its sole focus on anxious experiences. Moreover, some of the items are redundant with experiential avoidance, (e.g., "When unpleasant thoughts occur, I must push them out of my mind"), suggesting that the BAFT may not be the most precise measure of the construct of defusion.

Experiential avoidance: The acceptance and action questionnaire-2 (AAQ-2; Bond et al. (in press)) is a 7-item measure that assesses the ability to accept undesirable internal events while continuing to pursue desired goals. The AAQ-2 is adapted from the original AAQ (Hayes, 1996), which has been widely used in studies of ACT. The scale is comprised of two factors: acceptance and action. Although to some extent defusion may be implicit in both subscales, it is not synonymous with either.

Mindfulness: Several measures of mindfulness have recently been developed. Among the most researched and widely used include the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the kentucky inventory of mindfulness skills (KIMS; Baer, Smith, & Allen, 2004), the five factor mindfulness scale (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) and the Philadelphia mindfulness scale (PHLMS; Cardaciotto et al., 2008). These measures differ along several dimensions, most importantly in how they conceptualize the specific constituents of mindfulness. As noted above, although defusion may play a role in mindfulness, it is more focused in scope, and does not necessarily require either enhanced perceptual experience or nonjudgmental acceptance of one's experience.

In summary, although a number of measures have been developed that tap constructs similar to defusion, none directly assesses defusion per se, either as a global construct, or independently of other constructs. In addition, aside from measures of mindfulness, most existing scales focus exclusively on cognitions rather than the broader scope of experience including feelings, sensations, memories, etc. Various acceptance-oriented models of CBT focus explicitly on distancing not only from cognitions but from these other experiences as well. We therefore sought to develop a brief, ecologically valid, and user-friendly self-report measure of defusion. In addition, because we viewed the construct of defusion as one that respondents would have a difficult time fully grasping, we aimed to develop an extended introduction for the scale that would offer a comprehensive explanation. The presence of an extended definition of the defusion reflects a novel type of measurement tool and is a departure from the more conventional approach of generating items that use simple language to capture an element of the construct of interest. Having such an introduction was designed in particular to minimize the problem of comparing participants who have or have not already been exposed to the construct of defusion through a treatment that utilizes this construct. Despite some limitations to this approach, including concerns about increased desirability effects, we believed this approach reflects an improvement over measures that do not sufficiently explain defusion. As part of the validation process, we sought to examine whether a measure with an extended introduction could achieve sufficient psychometric properties to promote its use as a measurement tool.

The Drexel defusion scale (DDS) was developed in four phases: (1) item (and introductory statement) generation, modification, and selection; (2) initial factor structure, internal consistency, and convergent validity; (3) validation analyses with a normative student sample; and (4) validation analyses with clinical samples.

6.1. Phase 1: Item generation and selection

6.1.1. Phase 1 method

Faculty and doctoral students in a Ph.D. program in clinical psychology who were familiar both with the construct of cognitive defusion as well as cognitive behavioral therapies generated items for the DDS. Based on these items, an introduction and 10 vignettes addressing a variety of life domains were created. The approximately 350-word introduction, which was a modification of the explanation provided by a popular ACT self-help book (Hayes & Smith, 2005), describes the concept of defusion in lay terms. Respondents were asked to rate each of the 10 vignettes in terms of their ability to distance themselves from a variety of psychological experiences. Items were designed to reflect a Grade 5 reading level.

Expert judges (i.e., recognized researchers who have published in the areas of ACT, decentering, MBCT, and mindfulness) were recruited to establish the content validity of these 10 items and the introduction and to determine whether any of the original ten items should be dropped or altered. Thirteen expert judges were recruited, exceeding the number of judges recommended by experts in test construction (Netemeyer, Bearden, & Sharma, 2003). The introduction, list of items, and an explanation of the purpose of the study were submitted to the expert judges who made two ratings for each item: (1) how well the item reflected defusion, and (2) the quality with respect to ease of understanding for the general population, free of bias, and inoffensiveness. Items were rated on a 5-point Likert scale (1=*very poor*; 2=*poor*; 3=*fair*; 4=*good*; 5=*very good*). Additionally, judges were given the opportunity to comment on the introduction, each item, and the global measure in response to open-ended prompts. All responses were completed independently and anonymously via an internet-based survey, though raters had the opportunity to reveal their identity at the conclusion of the survey if they so chose.

6.1.2. Phase 1 results

Overall, findings suggest that expert judges found the introduction and the initial items to be fairly good representations of defusion. Mean ratings for how well these 10 items reflected the definition of defusion ranged from 3.5 to 3.8, with an overall mean of 3.62 (SD=.80). As recommend by Aiken (1985), we also calculated V Index statistics for each item, which provide an overall measure of content validity for n raters on a single scale for multiple items and is a small-sample technique to approximate large scale probabilities. Three items were rated by all judges as highly reflecting defusion ($V > .67$, $p < .05$); these were retained without modification. The seven remaining items trended towards significance (Vs ranged from .62 to .65) and were subjected to modification based on the judges' comments. No item was suggested for removal by the judges, and therefore all ten items were included in the final version. The introduction was also slightly modified based on judges' comments.

6.1.3. Phase 1 discussion

Items for the DDS were initially generated by individuals familiar with the theoretical construct of cognitive defusion and its clinical manifestations. Expert judges provided valuable feedback that supported the retention of 10 items, some of which were modified according to their feedback.

6.2. Phase 2: Initial factor structure; internal consistency; and convergent validity

Following initial item generation, we aimed to examine the DDS's internal factor structure and reliability. We hypothesized

that the DDS would show a unifactorial latent structure and good internal consistency. We also sought to compare it to related measures to examine its convergent and divergent validity. We predicted the DDS would be more strongly correlated with another measure of defusion/decentering than with measures of mindfulness or experiential acceptance. Given the theoretically-derived notion that defusion is part of a healthy coping style, we predicted associations to two psychological outcomes: quality of life and psychiatric symptom levels.

7. Phase 2 method

7.1. Participants and procedures

Two hundred and thirty-five undergraduate students (132 males, 103 females) in psychology courses were recruited for the initial validation phase of this project in exchange for extra course credit. Participants currently receiving psychiatric or psychological treatment were excluded. Participants' ages ranged from 18 to 42 years old, with a mean age of 20.1 years (SD=2.83). Participants' self-identified ethnicity was as follows: 63.8% White/Caucasian/European decent, 20.4% Asian/Pacific Islander, 7.3% Black/African–American/Caribbean American, 2.6% Hispanic/Latino/Latina, 2.1% multi-racial, 3.0% "other," and 0.4% Native American. The DDS and the PHLMS were administered to the full sample. A subgroup of the sample (n=135) was randomized to complete additional questionnaires, and were administered the seven additional measures described below. Sample 1 will be used to refer to the 100 participants who completed only the DDS and PHLMS and Sample 2 will be used to refer to the 135 participants who completed the DDS and additional measures.

8. Measures

Drexel defusion scale: The refined, 10-item DDS was administered to all 235 participants. In order to further assess the introduction to the measure, the first 135 participants were additionally asked to rate the extent to which the DDS introduction section helped him/her understand the term defusion. Using a 6-point Likert scale ranging from "not at all" (0) to "very much" (5), the mean utility rating of the introduction in helping elucidate the concept of defusion was 4.44 (SD=.97), suggesting that participants found it very helpful. The following measures were used to facilitate convergent validity analyses:

Philadelphia mindfulness scale: (PHLMS; Cardaciotto et al., 2008). The PHLMS is a 20-item self-report measure designed to assess mindfulness, and its two key constituents, present-moment awareness and nonjudgmental acceptance. Items are rated on a 5-point Likert scale (1=never, 5=very often) based on the frequency that subjects experienced the described item over the last week. Higher total scores on the measure indicate greater mindfulness.

Kentucky inventory of mindfulness skills: (KIMS; Baer et al., 2004). The KIMS is a self-report inventory assessing various mindfulness skills. It measures one's tendency to be mindful in daily life while seeking to be understandable to both general and clinical populations, regardless of their knowledge of meditation. The KIMS consists of 4 subscales: Observe, Accept with Nonjudgment, Act with Awareness, and Describe.

Acceptance and action questionnaire-2: (AAQ-2; Bond et al. (in press)). The AAQ-2 is a 10-item measure written to assess an individual's ability to accept undesirable internal events while otherwise continuing to pursue desired goals. It is an updated version of the Acceptance and action questionnaire (AAQ; Hayes, 1996). Items are rated on a 7-point Likert scale (1=never true, 7=always true). Higher scores indicate more psychological acceptance.

Experiences questionnaire: (EQ; Fresco et al., 2007). The EQ includes 14 decentering items (e.g., "I can observe unpleasant feelings without being drawn into them" are rated on a 5-point Likert scale (1=never, 5=all the time) based on the frequency that subjects experience the described item.

Quality of life inventory: (QOLI; Frisch, 1994). The QOLI is designed to assess life satisfaction and outcome with a single score based on 16 areas of life. Categories include topics such as love, work, and recreation. The QOLI has been widely regarded as having good reliability and validity (Frisch, Cornell, Villanueva, & Retzlaff, 1992).

Brief Symptom inventory: (BSI; Derogatis & Melisaratos, 1983). The BSI is a 53-item self-report measure assessing symptoms of psychopathology. Participants rate, on a 5-point scale, the extent to which each item distresses them (0=Not at all, 4=Extremely). The BSI is comprised of nine subscales (alpha ranges from .75 to .89) that combine to form a total score. Its internal consistency and reliability are well documented (Derogatis, 1993).

8.1. Phase 2 results

An unrestricted factor analysis using principal component analysis extraction methods and a Promax (i.e., oblique) rotation was conducted to determine item retention. Data from both Sample 1 and Sample 2 were included. An oblique rotation method was chosen given that it allows the factors to correlate and can provide more meaningful theoretical factors (Netemeyer et al., 2003). The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was .847, and Bartlett's Test of Sphericity was significant. The analysis produced a two-factor solution with eigenvalues greater than one. As recommended by Floyd and Widaman (1995), we examined the scree plot to further identify how many factors to retain as solely relying on eigenvalues greater than 1.0 can lead to an overestimation of the number of meaningful factors. The scree plot revealed that the primary factor accounted for a significant portion of the total variance (41.0%), whereas the second factor contributed relatively little (11.2%). Furthermore, both factors were moderately correlated (r=.46) and appeared to represent the greater construct of defusion rather than independent factors within defusion (see Table 1 for summary of factor loading for all factor analyses in Phase 2). A second factor analysis was completed specifying a single factor structure, with the main factor explaining 41.0% of the total variance. Moderate to strong factor loadings existed for almost all items in the single factor structure.

Table 1
Summary of Drexel defusion scale factor loadings from initial EFA sample (Phase 2 and 3).

Item	Factor 1	Factor 2	Factor 1	Factor 2
1. Feelings of anger	.465	**.615**	.268	**.568**
2. Cravings for food	.249	**.643**	.108	**.606**
3. Physical pain	.316	**.852**	.173	**.721**
4. Anxious thinking	**.648**	.299	**.712**	.370
5. Thoughts of self	**.769**	.274	**.791**	.175
6. Thoughts of hopelessness	**.864**	.309	**.817**	.073
7. Feelings of fear	**.704**	.447	**.711**	.368
8. Thoughts about motivation	**.738**	.296	**.793**	.265
9. Thoughts about future	**.469**	.409	.398	**.532**
10. Feelings of sadness	**.702**	.517	**.713**	.318

Note: N=235 for Phase 2, N=144 for Phase 3.

9. Internal consistency

Reliability analyses suggested good internal consistency (Cronbach's alpha = .83). All inter-item correlations were statistically significant and ranged from .15 to .66, and all items were significantly positively correlated with the total score. Item-to-total correlations ranged from .46 to .77.

10. Convergent/divergent validity

The pattern of correlations was generally consistent with predictions. The DDS was most strongly associated with the Decentering subscale of the EQ, and less so with other measures (Tables 2 and 3). As predicted, defusion was positively correlated with quality of life and negatively with a psychiatric symptom index among Sample 2 participants (Table 3).

10.1. Phase 2 discussion

Results from the initial phase of DDS administration suggest the DDS introduction section was useful in explaining the construct of defusion, as the average participant rating was above four ("quite a lot"). Results from the exploratory factor analysis conducted on a sample of undergraduates suggest a one-factor solution is appropriate for these data. Additionally, this solution is deemed most rational as defusion is considered a unitary construct. All 10 items significantly correlated with each other and the DDS total score and were retained as 8 to 10 items per dimension has been suggested as an ideal scale length (Netemeyer et al., 2003). The results revealed good internal consistency for the total score and items. Convergent validity analyses generally yielded expected results as the DDS most significantly correlated with measures of acceptance and decentering. Lastly, as expected, higher scores on the DDS were correlated with less psychopathology and a higher quality of life.

10.2. Phase 3: EFA and validity analyses in a clinical sample

To examine further the psychometric properties and predictive value of the DDS, we administered it to a clinical sample. As with the nonclinical sample, we predicted the DDS would show a unifactorial solution and strong internal consistency, that it would be highly correlated with a measure of meta-cognitive awareness (in this case, ATQ-B) but minimally correlated with measures of mindfulness. In addition, we predicted that the DDS would be associated with measures of psychopathology, functioning and well-being. We tested *incremental* validity by examining whether associations with these measures remained even after controlling for related measures.

11. Phase 3 method

11.1. Participants and procedure

Participants ($n = 144$) presented for treatment at a university counseling center that serves individuals pursuing health-related

Table 2
Means, (standard deviations), and zero-order correlations among defusion, mindfulness, experiential avoidance, and decentering (Phase 2).

Measure	1	2	3	4	5	6	7	8	9
1. Defusion		−.02	.24*	.11	.12	.12	.19*	.29*	−.43**
2. Mindfulness-awareness			.08	.64	−.10	.00	.26**	.11	−.24**
3. Mindfulness-acceptance				−.09	.63**	.27**	.24**	.57**	−.24**
4. Observe					−.30**	−.06	.18*	−.13	−.26**
5. Accept with nonjudgment						.28**	.11	.53**	−.05
6. Act with awareness							.38**	.32**	−.39**
7. Describe								.20*	−.36**
8. Experiential avoidance									−.39**
9. Decentering									
Mean	27.30	36.60	29.36	26.12	19.15	17.99	18.13	50.45	39.11
(*Standard Deviation*)	(7.28)	(4.32)	(6.33)	(6.46)	(6.27)	(5.31)	(4.92)	(9.85)	(5.39)

Note: $N = 135$; Defusion = Drexel defusion scale total score; Mindfulness-awareness = Philadelphia mindfulness scale awareness subscale score; Mindfulness-acceptance = Philadelphia mindfulness scale acceptance subscale score; Observe = Kentucky inventory of mindfulness skills observe subscale score; Accept with nonjudgment = Kentucky inventory of mindfulness skills accept with nonjudgment subscale score; Act with awareness = Kentucky inventory of mindfulness skills act with awareness subscale score; Describe = Kentucky inventory of mindfulness skills describe subscale score experiential avoidance = Acceptance and action questionnaire-2 total score; Decentering = Experiences questionnaire decentering subscale.

* $p < .05$ (two-tailed).
** $p < .01$ (two-tailed).

Table 3
Means, (standard deviations), and zero-order correlations among defusion, mindfulness, acceptance, symptom, and quality of life measures (Phase 3).

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Defusion phase 2		.18	.19									−.31**	.37**		
Mean	37.12	35.57	29.82									90.41	22.53		
Standard deviation	8.51	5.49	6.93									27.12	3.24		
Defusion phase 3		.08	.32**	.05	.37**	.33**	.26**	−.25**	−.45**	−.43**	−.50**	−.49**	.47**	.37**	.40**
Mean	24.77	34.19	28.00	23.37	19.00	17.82	19.47	51.86	51.06	13.15	16.39	76.88	.97	13.80	13.53
(Standard deviation)	8.53	7.03	7.20	9.65	8.07	5.89	6.13	6.95	40.54	10.29	10.29	15.52	2.13	5.89	6.86

Note: $N = 144$; 1 = Drexel defusion scale total score; 2 = Philadelphia mindfulness scale awareness subscale score; 3 = Philadelphia mindfulness scale acceptance subscale score; 4 = Kentucky inventory of mindfulness skills observe subscale score; 5 = Kentucky inventory of mindfulness skills accept with nonjudgment subscale score; 6 = Kentucky inventory of mindfulness skills Act with awareness subscale score; 7 = Kentucky inventory of mindfulness skills describe subscale score; 8 = Acceptance and action questionnaire-2 total score; 9 = thought believability; 10 = Anxiety, 11 = Depression, 12 = Overall symptoms. 13 = Quality of life, 14 = Happiness, 15 = Life satisfaction.

* $p < .05$ (two-tailed).
** $p < .01$ (two-tailed).

degrees and certifications. The most common presenting problems were depressive (45.3%) or anxiety-related (24.2%) disorders, which was assessed using the Mini-International Neuropsychiatric Interview (Sheehan, Lecrubier, & Sheehan, 1998). Participants were 84.7% female, and were diverse in age (18 through 53, $M=26.0$, $SD=5.35$). The sample was primarily Caucasian (57%, African American: 10%, Asian: 13%, Latino: 6%, Other: 14%).

12. Measures

Drexel defusion scale (DDS): See description above.

Beck depression inventory-II: (Beck, Steer, & Brown, 1996). The BDI-II is an extensively used and studied inventory designed to assess current severity of depressive symptoms. It was initially developed from clinical observations of depressed and non-depressed psychiatric patients. Symptoms are represented in a 21-item questionnaire, and patients are asked to rate the severity of each on an ordinal scale from 0 to 3. The BDI-II is based largely on the first edition of the BDI (Beck, Ward, & Mendelson, 1961), which has indicated good reliability and strong validity in clinical and non-clinical samples (see Beck, Steer, & Carbin, 1988b for a review).

Beck anxiety inventory: (Beck, Epstein, Brown, & Steer, 1988a). The BAI is a widely-used instrument for assessing anxious symptoms. It is a self-report measure that reliably differentiates anxious from non-anxious groups in a variety of clinical populations, as well as discriminating anxiety from depression. The scale consists of 21 items, including physiological and cognitive components, each describing a common symptom of anxiety (subjective, somatic, or panic-related). Participants are asked to rate how much they have been bothered by each symptom over the past week on a 4-point scale ranging from 0 to 3. The items are summed to obtain a total score that ranges from 0 to 63. The BAI has shown high internal consistency ($\alpha=.92$) and has indicated good reliability and strong validity in clinical and non-clinical populations (Beck et al., 1988a).

Outcome questionnaire: (OQ; Lambert et al., 1996). The OQ was developed to be used as a brief measure of patient functioning, designed to be sensitive to patient change over time, and to be utilized with a wide range of mental disorders. It can function as a session-by-session measure as well as an outcome measure. The OQ is a 45-item questionnaire that assesses subjective distress (25 items), interpersonal relationships (11 items), and social role performance (9 items). The measure provides a total score (sum of all items) ranging from 0 to 180 and three individual domain scores. The OQ has adequate internal consistency ($\alpha=.93$) and appropriate content and concurrent validity (Lambert et al., 1996).

Quality of life inventory: (QOLI; Frisch, 1994). See description above.

Satisfaction with life scale: (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). The SWLS is a 5-item scale designed to measure subjective satisfaction with life regardless of emotional states. Items are rated from 1 (absolutely untrue) to 7 (absolutely true). Thus, scores range from 5 to 35, with higher scores indicating greater life satisfaction. The scale has high internal and test–retest reliability and is consistently related to other indices of well-being (Pavot & Diener, 1993).

Subjective happiness scale: (SHS; Lyubomirsky & Lepper, 1999). The SHS is a 4-item global measure of subjective happiness. Items ask participants to rate their happiness on a 7-point Likert scale in response to prompts about their perception of their own happiness and how it compares to others. Data suggest the SHS has high internal consistency. Furthermore, its test–retest and self-peer correlations suggested good to excellent reliability, convergent, and discriminant validity.

Acceptance and action questionnaire-2: (AAQ-2; Bond et al. (in press)). See description above.

Philadelphia mindfulness scale: (PHLMS; Cardaciotto et al., 2008). See description above.

Kentucky inventory of mindfulness skills: (KIMS; Baer et al., 2004). See description above.

Automatic thought questionnaire-believability: (ATQ-B; Zettle & Hayes, 1986). The ATQ-B as described above, is based on the ATQ (Hollon & Kendall, 1980) and is a 30-item questionnaire designed to measure the believability of depressogenic thoughts. Items are rated on a 7-point Likert scale from 0 (not at all believable) to 6 (completely believable). Examples of thoughts include, "I wish I were a better person," and "I'm a failure." The reliability and validity of the ATQ has been supported in adults (Dobson & Breiter, 1983; Kazdin, 1990).

12.1. Phase 3 results

An unrestricted factor analysis using principal component analysis extraction methods and a Promax rotation was used to determine the factor structure of the DDS in a clinical sample. A confirmatory factor analysis was not used because we could not assume that the clinical population would necessarily respond in the same way as a non-clinical population. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was .825, and Bartlett's Test of Sphericity was significant. The analysis produced a two-factor solution with eigenvalues greater than one. As in Phase 2, we used the scree plot to examine the factors. The scree plot showed the primary factor accounted for a significant portion of the total variance (38.3%), whereas the second factor contributed significantly less (12.8%). Furthermore, the factors intercorrelated ($r=.33$), suggesting they reflected the general construct of defusion rather than specific elements within defusion (see Table 1 for summary of all factor loadings from Phase 3). These results generally replicated those of Phase 2. As in Phase 2, a second factor analysis was completed specifying a single factor solution; 38% of the total variance was explained by the 1 factor solution. Most items loaded strongly on the single factor, but the first three items (anger, food cravings, and pain) showed weaker loading, potentially supporting a two factor solution. However, given the other results suggesting a one-factor solution (including percent of variance explained by the single factor and eigen values) and the theory behind the measure suggesting a unified dimension, a one factor solution may be most parsimonious.

Reliability analyses suggested good internal consistency (Cronbach's alpha = .80). All inter-item correlations were statistically significant and ranged from .15 to .66. All items were significantly, positively correlated with the total score. Item-to-total correlations ranged from .46 to .77.

Table 3 summarizes participant means and standard deviations for all measures. Fisher's Z score transformations were used to compare the strength of the associations between the DDS and the ATQ-B with the strength of the average association between the DDS and scores of mindfulness and experiential acceptance. Results show the DDS total score correlated most strongly with ATQ-B, and were generally weaker with measures of mindfulness and experiential acceptance ($Z=2.1$, $p<.05$, Table 3). As predicted, DDS was associated with a number of measures of psychopathology, functioning and well-being (Table 4).

Incremental validity was assessed by examining the correlation between these measures and DDS, controlling for the effects of a number of constructs that have been shown to be related to the DDS and that themselves have been shown to be related to these measures of psychopathology and well-being. As seen in the table, all but one of the correlations between the DDS and these variables remained significant when controlling for the various covariates.

Table 4
Correlations of the Drexel defusion scale with psychopathology and well-being measures after controlling for other constructs (Phase 3).

Scale	Zero-order correlation	AAQ	ATQ-B	KIMS-Ob	DDS KIMS-Ac	Controlling for KIMS-Aw	KIMS-De	PHLMS-Ac	PHLMS-Aw
1. Depression	−.50**	−.47**	−.27**	−.50**	−.38**	−.45**	−.48**	−.44**	−.50**
2. Anxiety	−.43**	−.41**	−.27**	−.45**	−.31**	−.38**	−.44**	−.36**	−.47**
3. Functioning	−.49**	−.45**	−.31**	−.51**	−.35**	−.41**	−.49**	−.41**	−.52**
4. Happiness	.37**	.32**	.17	.36**	.23**	.34**	.31**	.30**	.36**
5. Quality of life	.47**	.45**	.36**	.47**	.38**	.41**	.45**	.42**	.47**
6. Life satisfaction	.40**	.35**	.23**	.40**	.30**	.37**	.37**	.35**	.40**

Note: $N=138$; DDS = Drexel defusion scale total score; Depression = Beck depression inventory-II; Anxiety = Beck anxiety inventory; Functioning = Outcome questionnaire; Happiness = Subjective happiness scale; Quality of life = Quality of life index; Life satisfaction = Subjective life satisfaction questionnaire; AAQ = Acceptance & action questionnaire; ATQ-B = Automatic thought questionnaire-believability subscale score; KIMS-Ob = Kentucky inventory of mindfulness skills observe subscale score; KIMS-Ac = Kentucky inventory of mindfulness skills accept with nonjudgment subscale score; KIMS-Aw = Kentucky inventory of mindfulness skills act with awareness subscale score; KIMS-De = Kentucky inventory of mindfulness skills describe subscale score; PHLMS-Ac = Philadelphia mindfulness scale acceptance subscale score; PHLMS-Aw = Philadelphia mindfulness scale awareness subscale score;

* $p < .05$ (two-tailed).

** $p < .01$ (two-tailed).

12.2. Phase 3 discussion

To assess further its psychometric properties and validity, we administered the DDS to a sample of patients seeking treatment at the counseling center of a large urban university. Results support a unified, one-factor solution. Internal consistency analyses showed the measure to be moderately reliable. Incremental validity analyses were particularly noteworthy, as they showed the DDS to be significantly correlated in expected directions with measures of psychopathology and well-being after controlling for measures of similar constructs. These results suggest the DDS provides an important addition to the existing body of assessment tools.

12.2.1. Phase 4: Association with psychotherapy outcome

Given defusion's purported role as a mechanism of psychotherapeutic action, we hypothesized that changes in the DDS would be associated with changes in psychotherapy outcome. A series of treatment outcome studies utilizing the DDS were conducted to examine whether scores on this measure were associated with clinical improvement.

12.3. Phase 4 method

12.3.1. Participants, procedure and measures

Study 1: A subset of participants from Phase 3 were enrolled in a randomized controlled trial comparing ACT and traditional CT (see Forman, Herbert, Moitra, Yeomans, & Geller, 2007). A portion of these individuals ($n=28$; $n_{ACT}=12$, $n_{CT}=16$) were administered the DDS, as well as the OQ, at pre-treatment and again at post-treatment. The treatment design emphasized external validity, and duration was set consensually by therapist and patient ($M=8.9$ sessions). Therapists for both treatment conditions were graduate students who had completed an intensive training program in both ACT and traditional CT. Per recommendations from Hoffmann (2004) and Lindsey (1997), we computed change in defusion and outcome by regressing pre-treatment scores onto post-treatment scores, and calculating the residual.

Study 2 examined the effectiveness of a 12-session ACT treatment for adults with social anxiety disorder. Individuals ($n=45$) with a primary diagnosis of social anxiety disorder were evaluated by an independent assessor and completed self-report measures of social anxiety at pre-, mid-, and post-treatment. The primary outcome measure for this within-subjects design was self-reported levels of fear in social situations.

Study 3 evaluated the short-term effectiveness of a brief, physical-activity-focused ACT intervention (see Butryn, Forman, Hoffman, Shaw, & Juarascio, 2011). Young adult, female participants were randomly assigned to an Education ($n=19$) or ACT ($n=35$) intervention, both of which focused on increasing physical activity. The main outcome measure for this study was gym attendance as measured by card swipes at the student gym.

12.4. Phase 4 results

For study 1, regressed changed in defusion was positively and strongly associated with regressed change in psychological functioning ($r=.49$, $p<.01$). As predicted by theory, this relationship held for patients receiving ACT ($r=.64$, $p=.02$) as well as those receiving CT ($r=.46$, $p=.07$; trend). Due to a relatively small sample size, we did not have the power to test whether the apparently stronger association for ACT was statistically reliable, or to conduct formal mediational analyses.

In Study 2 residualized change in DDS scores (from pre-treatment to mid-treatment) was negatively associated with residualized change in scores on the Brief Fear of Negative Evaluation Scale (from mid-treatment to post-treatment) ($r=-.30$, $p=.04$), suggesting that increased levels of defusion are associated with reductions in social-evaluative anxiety.

Study 3 found that residualized change in DDS scores from pre (week 1) to post (week 5) were correlated with residualized changed in gym attendance from pre to post ($r=.45$, $p=.03$). These findings suggest as individuals achieve greater levels of defusion, they may be more likely to engage in health-promoting behaviors. In order to examine changes in process variables between baseline and post-intervention, a two (time) by two (group) repeated measures multivariate analysis of variance (MANOVA) was performed with Physical activity AAQ scores (PAAAQ), PHLMS subscales, and the DDS as dependent variables. Omnibus results indicated a significant time × group effect ($F(1, 41)=38.0$, $p<.05$, $\eta^2=.28$). Follow-up analyses revealed that PAAAQ and the awareness subscale of the PHLMS significantly increased between baseline and post-intervention for both groups, but that group membership did not moderate this effect. However, the time by group interaction was significant in the case of DDS. Specifically, DDS increased among ACT participants, but decreased among Education group participants (Table 1).

12.5. Phase 4 discussion

Although research examining defusion as a key mechanism of change is still in its early stages, the aforementioned results

suggest that one's ability to achieve psychological distance from distressing internal experiences (e.g., motivation to exercise, social anxiety, rumination) is associated with enhanced psychological functioning. Future research is needed to examine whether the strength of this relationship might vary as a function of intervention type (e.g., acceptance based versus traditional CBTs).

13. Discussion

Defusion is commonly considered to be an important mechanism of action underlying therapeutic change in CBT (Teasdale et al., 2001). Despite the belief that defusion plays a key role in promoting psychological change, the concept has received considerably less attention and study than related constructs. Currently there are few measures of defusion, and those that do exists often confound it with other similar but distinct constructs such as psychological acceptance or mindful awareness (e.g., Bond et al. (in press)) or mindfulness (e.g., Baer et al., 2004; Cardaciotto et al., 2008). In particular, no measure has existed that measured defusion across the spectrum of internal experiences, beyond just depressive or anxious thinking. The current study reported on the development and validation of a new measure of defusion, the Drexel defusion scale.

Results from expert ratings suggested that a set of initially-created items and an introductory definition to these items were understandable and adequately tapped the construct. Items scoring below the V threshold were further refined per expert consensus. Two exploratory factor analyses on clinical and non-clinical samples indicated that the refined measure has a single factor (although some data suggest a second factor may exist), and internal reliability analyses and intercorrelations suggest that all the items cohere. In addition, the measure demonstrated convergent (e.g., higher associations with other measures of defusion) and divergent (e.g., more moderate associations with defusion-linked constructs such as mindful acceptance and awareness) validity. Given the moderate correlations with similar constructs, the DDS does not appear to be redundant with previously existing measures, suggesting that it is assessing a distinct construct that is not captured by these other measures. The DDS also demonstrated incremental validity in that it was associated with mood and anxiety symptoms, even when controlling for levels of negative automatic thinking and mindfulness.

When taken as a whole, results of these studies suggest that the DDS is a viable, reliable, and valid measure of defusion. In addition, results help to validate a conceptualization of defusion that is more comprehensive than more narrow definitions revolving only around the ability to appreciate the potential invalidity of one's depressive cognitions. Given the current controversies and confusions around psychotherapeutic mechanisms of action and the cross-theoretical interest in defusion and its allied constructs, it is vitally important to continue to attempt to refine measurements of defusion, and to obtain measurements of defusion at various points within psychotherapy outcome studies. The current results suggest that the DDS is a reasonable choice for such a measure.

The study is strengthened by its use of a comprehensive approach to validation using multiple phases. The content of the DDS was judged by a large number of experts in the field, exceeding the recommendations by Netemeyer et al., 2003. The use of both a normative and a clinical sample bolster the validation results and support the use of the DDS among differing samples. Despite the strengths of the study, there are also several limitations. Although care was taken to maintain the reading level for the measure at a grade 5 level, the instructions explaining defusion are nevertheless relatively long, and might be too complex for some readers to understand. The scale introduces the concept of defusion didactically, which is different from the way it is conveyed in the context of experiential psychotherapy such as ACT. This didactic approach might lead to a functionally different understanding of defusion from what one might experience in the context of psychotherapy. In addition, the DDS scenarios may be too vague and not psychologically imminent enough to allow subjects to make an accurate self-assessment of how fused they would be with particular thoughts if exposed to those scenarios in real life. Additional research is needed to examine whether participants were actually able to self-reflect on their ability to defuse from hypothetical situations. Asking participants to make ratings based on imagined scenarios could also contribute to less ecologically valid responses. Future research is needed to examine the understandability and impact, in both clinical and non-clinical samples, of the DDS defusion instructions.

Psychometrics were analyzed using a moderately restricted sample that was moderate in size, and future research with a larger samples is warranted. The results were somewhat conflicting for the presence of a two factor or a one factor solution. It is possible that defusion from some thoughts or feelings such as pain, anger, and cravings may load on a different factor, and additional research should continue assessing the factor structure of this measure to ensure that a one factor solution does, in fact, best reflect the measure's psychometric structure. Future research with larger sample sizes using confirmatory factor analyses (CFA) would also allow for greater confidence in the structure of the questionnaire. Because EFA was used on both the clinical and non-clinical samples to examine whether similar factor structures emerged, it is important to use CFA on future samples to confirm the observed factor structure. Although the study did use current gold standard techniques for assessing construct validity, it is difficult to verify construct validity for such a novel measure in which there are no existing measures that are validated to assess the same construct. Although similar measures do exist, these measures conceptualize defusion somewhat differently and therefore comparisons with these measures may not provide the clearest assessment of construct validity.

In addition, it is possible that the measure's instructions might be powerful enough in and of themselves to increase participants' level of defusion. While this seems unlikely, future work might attempt to detect the extent to which defusion ratings increase after exposure to an extended definition. If there is such an increase, an additional critical aim would be determining whether the source of the increase was a result of better understanding the construct versus a genuine increase in the level of defusion. Taken as a whole, we believe that our data supports the former and as well as the approach of an extended definition of a complicated construct like defusion, but a more definitive answer awaits future work.

An additional limitation of this (and perhaps most) self-report measures of this type is that the instructions imply that defusion is desirable, thereby increasing the extent to which social desireability may play a role in responding. Although this concern is less problematic in longitudinal research in which the baseline measure provides a comparison point or in comparative trials in which differences in means between groups are assessed, it may be a concern for researchers who use this measure cross-sectionally.

Despite the potential limitations of providing a definition of defusion within the measure, we believe that the DDS nevertheless improves on existing measures that do not contain such instructions. Current measures of defusion do not explain the concept well, which raises the risk that any increases in defusion observed from pre- to post-treatment are attributable simply to

Table A1

	Based on the definition of *defusion* above, please rate each scenario according to the extent to which you would normally be in a state of *defusion* in the specified situation. You may want to read through all the examples before beginning to respond to the questions. (Important: you are not being asked about the degree to which you would think certain thoughts or feel a certain way, but the degree to which you would *defuse* if you did.)	(0) Not at all	(1) A little	(2) Somewhat	(3) Moderately	(4) Quite a lot	(5) Very much
1	**Feelings of anger.** You become angry when someone takes your place in a long line. To what extent would you normally be able to *defuse* from feelings of anger?	☐	☐	☐	☐	☐	☐
2	**Cravings for food.** You see your favorite food and have the urge to eat it. To what extent would you normally be able to *defuse* from cravings for food?	☐	☐	☐	☐	☐	☐
3	**Physical pain.** Imagine that you bang your knee on a table leg. To what extent would you normally be able to *defuse* from physical pain?	☐	☐	☐	☐	☐	☐
4	**Anxious thoughts.** Things have not been going well at school or at your job, and work just keeps piling up. To what extent would you normally be able to *defuse* from anxious thoughts like "I'll never get this done."?	☐	☐	☐	☐	☐	☐
5	**Thoughts of self.** Imagine you are having a thought such as "no one likes me." To what extent would you normally be able to *defuse* from negative thoughts about yourself?	☐	☐	☐	☐	☐	☐
6	**Thoughts of hopelessness.** You are feeling sad and stuck in a difficult situation that has no obvious end in sight. You experience thoughts such as "Things will never get any better." To what extent would you normally be able to *defuse* from thoughts of hopelessness?	☐	☐	☐	☐	☐	☐
7	**Thoughts about motivation or ability.** Imagine you are having a thought such as "I can't do this" or "I just can't get started." To what extent would you normally be able to *defuse* from thoughts about motivation or ability?	☐	☐	☐	☐	☐	☐
8	**Thoughts about your future.** Imagine you are having thoughts like, "I'll never make it" or "I have no future." To what extent would you normally be able to *defuse* from thoughts about your future?	☐	☐	☐	☐	☐	☐
9	**Sensations of fear.** You are about to give a presentation to a large group. As you sit waiting your turn, you start to notice your heart racing, butterflies in your stomach, and your hands trembling. To what extent would you normally be able to *defuse* from sensations of fear?	☐	☐	☐	☐	☐	☐
10	**Feelings of sadness.** Imagine that you lose out on something you really wanted. You have feelings of sadness. To what extent would you normally be able to *defuse* from feelings of sadness?	☐	☐	☐	☐	☐	☐

the intervention's explanations of defusion rather than a true increase in defusion. The inclusion of an extended definition of the construct in our measure may represent an improvement over existing measures by ensuring that respondents understand the construct from the outset.

Although additional validation is warranted and measure refinement should be continued, the current studies do suggest that the DDS could be a useful measure of defusion, as broadly defined to address a range of psychological experiences. The availability of this measure opens up several areas for future research. First, it will be important to determine how the DDS compares to other measures of related constructs in predicting contemporaneous psychopathology and outcome. The DDS may be a useful measure to investigate questions related to the relationships among cognitive, affective, and physiological experiences. Mediational analyses would also be beneficial, and could allow for a better understanding of psychotherapeutic mechanisms of actions among varying types of cognitive behavior therapies.

Appendix 1. Drexel defusion scale (DDS)

Defusion is a term used by psychologists to describe a state of achieving distance from internal experiences such as thoughts and feelings. Suppose you put your hands over your face and someone asks you, "What do hands look like?" You might answer, "They are all dark." If you held your hands out a few inches away, you might add, "they have fingers and lines in them." In a similar way, getting some distance from your thoughts allows you to see them for what they are. The point is to notice the process of thinking as it happens rather than only noticing the results of that process, in other words, your thoughts. When you think a thought, it "colors" your world. When you see a thought from a distance, you can still see how it "colors" your world (you understand what it means), but you also see that you are doing the "coloring." It would be as if you always wore yellow sunglasses and forgot you were wearing them. Defusion is like taking off your glasses and holding them several inches away from your face; then you can see how they make the world appear to be yellow instead of only seeing the yellow world.

Similarly, when you are defused from an emotion you can see yourself having the emotion, rather than simply being in it. When you are defused from a craving or a sensation of pain, you do not just experience the craving or pain, you see yourself having them. Defusion allows you to see thoughts, feelings, cravings, and pain as simply processes taking place in your brain. The more defused you are from thoughts or feelings, the less automatically you act on them.

For example, you may do something embarrassing and have the thought "I'm such an idiot." If you are able to defuse from this thought, you will be able to see it as just a thought. In other words you can see that the thought is something in your mind that may or may not be true. If you are not able to defuse, you would take the thought as literally true, and your feelings and actions would automatically be impacted by the thoughts.

See Appendix Table A1.

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