2010

Cognitive Defusion Versus Thought Distraction: A Clinical Rationale, Training, and Experiential Exercise in Altering Psychological Impacts of Negative Self-Referential Thoughts.

Akihiko Masuda
Georgia State University, amasuda@gsu.edu

A. B. Feinstein

J. W. Wendell

S. T. Sheehan

Running head: COGNITIVE DEFUSION

Cognitive Defusion versus Thought Distraction: A Clinical Rationale, Training, and Experiential Exercise in Altering Psychological Impacts of Negative Self-Referential Thoughts

Akihiko Masuda,*′ ** Amanda B. Feinstein, Johanna W. Wendell, & Shawn Sheehan

Georgia State University

*Address editorial correspondence to: Aki Masuda
Department of Psychology
Georgia State University
P.O. Box 5010
Atlanta, GA 30302-5010
Phone: (404) 413-6298
Fax: (404) 413-6207
psyaxm@langate.gsu.edu

**A copy of the complete intervention manual is available from the first author.

Abstract

Using two modes of intervention delivery, the present study compared the effects of a cognitive defusion strategy with a thought distraction strategy on the emotional discomfort and believability of negative self-referential thoughts. One mode of intervention delivery consisted of a clinical rationale and training (i.e., Partial condition). The other mode contained a condition-specific experiential exercise with the negative self-referential thought in addition to the clinical rationale and training (i.e., Full condition). Non-clinical undergraduates were randomly assigned to one of five protocols: Partial-Defusion, Full-Defusion, Partial-Distraction, Full-Distraction, and a distraction-based experimental control task. The Full-Defusion condition reduced the emotional discomfort and believability of negative self-referential thoughts significantly greater than other comparison conditions. The positive results of the Full-Defusion condition were also found among participants with elevated depressive symptoms.

Key Words: acceptance; Acceptance and Commitment Therapy; believability; cognitive defusion; emotional discomfort; mindfulness; self-referential thoughts; thought distraction

Cognitive Defusion versus Thought Distraction: A Clinical Rationale, Training, and Experiential Exercise in Altering Psychological Impacts of Negative Self-Referential Thoughts

According to acceptance- and mindfulness-based cognitive behavioral interventions, the major problem of dysfunctional private events (e.g., thoughts, feelings, physiological sensations, memories) is their *stimulus functions* (e.g., Fisher & Wells, 2005; Hayes, Follette, & Linehan, 2004; Segal, Teasdale, & Williams, 2004). For example, Acceptance and Commitment Therapy (ACT) (Hayes, Strosahl, & Wilson, 1999) explicitly states that the modification of problematic private events in *function*, not in *form* or *frequency*, is the aim of treatment. A set of techniques used particularly for this purpose in ACT is called c*ognitive defusion* strategies (e.g., Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Cognitive defusion strategies are often employed in contexts where clients are excessively entangled or *fused* with their difficult private events, such as a negative self-referential thought (e.g., "I am worthless"; "I" = "worthlessness").

Several published analogue studies are now available, demonstrating positive effects of defusion strategies (e.g., Healy et al., 2008; Masuda, Hayes, Sackett, & Twohig, 2004) and related techniques, such as acceptance and mindfulness (e.g., Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Eifert & Heffner, 2003; Feldner, Zvolensky, Eifert, & Spira, 2003; Levitt, Brown, Orsillo, & Barlow, 2004; Liverant, Brown, Barlow, & Roemer, 2008). To date, the most thoroughly investigated defusion technique is a rapid vocal repetition of a thought (Titchener, 1910). Research has shown that, when delivered as the combined form of clinical rationale, training, and experiential exercise, the defusion strategy reduces emotional discomfort and believability of negative

self-referential thoughts (Masuda et al., 2004), and does so greater than the distraction-based strategy (e.g., Masuda et al., 2010) which is theorized to be qualitatively different from defusion- and acceptance-based methods (Hayes et al., 2006).

Although reporting the superiority of the defusion protocol to control-based strategies, previous studies are subject to several limitations. One methodological limitation is the within-group variability of active control-based comparison conditions (Masuda et al., 2004; Masuda et al., 2010). For example, in Masuda et al. (2010), whereas the contents/procedures of tasks in the defusion condition were fairly standardized across participants, the stimulus used by the participants for distraction in the thought distraction group was not systematically controlled.

Additionally, given the multi-component nature of the intervention protocols, it is unclear which component or combination of components (i.e., clinical rationale, training, experiential exercise) in the defusion protocol is crucial in altering the stimulus function of the negative self-referential thought. This is an important research question because ACT emphasizes experiential learning, rather than mere rule-following, in the context of behavior change. Previous studies on acceptance-based coping strategies have shown that experiential components, when combined with a brief clinical rationale/instruction, play a crucial role in altering the stimulus function of target private events (McMullen et al., 2008). Although supporting these findings, previous defusion studies (e.g., Masuda et al., 2009) did not systematically investigate the additive effect of an experiential exercise.

Furthermore, it is important to explore the effects of the defusion protocol within the context of psychopathology. All of the previously conducted analogue studies of the cognitive defusion strategy were conducted with non-clinical college sample (e.g.,

Masuda et al., 2004, Masuda et al., 2009). Although evidence is limited, one study by Masuda et al. (2010) suggests a positive effect of the defusion strategy on self-referential negative thought among a college sample with elevated psychological distress. In the study, when delivered with the combined form of clinical rationale, training, and experiential exercise, the rapid vocal repetition strategy reduced the emotional discomfort and believability of negative self-referential thought among college students with elevated depressive symptoms. The study also suggested that the defusion protocol is effective regardless of the levels of depressive symptoms. Given these findings, it seems appropriate to first investigate whether the experiential exercise with the identified negative self-referential thought has any additive effects within a sub-sample of college students with elevated depressive symptoms, perhaps prior to investigating its effects among a clinical sample.

Using a non-clinical college sample, the present study investigates the effects of the cognitive defusion protocol (i.e., rapid thought repetition) and thought distraction on a self-referential negative thought. These active intervention protocols were delivered with two different modes: (1) a brief clinical rationale and training using a neutral word (i.e., word “milk”), and (2) an experiential exercise with the *identified* negative self-referential thought in addition to the clinical rationale and training. Based on previous findings (e.g., Masuda et al., 2010, McMullen et al., 2008), it was hypothesized that the defusion condition, when delivered with the clinical rationale, training, and experiential exercise, would reduce the emotional discomfort and believability of negative self-referential thoughts greater than comparison conditions. It was also hypothesized that, when the active interventions were delivered with a clinical rationale and training only, there

would be no significant group differences between defusion and thought distraction strategies. Finally, it was predicted that the defusion protocol containing the rationale, training, and experiential exercise, would produce favorable outcomes among the participants who reported elevated depressive symptoms. The present study employed the criteria of elevated depressive symptoms to select a subset of college students, in part because there is an established link between personal negative thoughts (the dependent variables of the study) and depression (e.g., Beck, Rush, Shaw, & Emery, 1979), and because depression is often conceptualized as an indicator of overall psychological well-being and functioning (e.g., Ryff & Keyes, 1995).

Method

Participants and Setting

The study was conducted at a large public 4-year university in Georgia. College undergraduates were recruited from undergraduate psychology courses through a web-based research participant pool. Of 170 students who agreed to participate, 147 individuals (n_{female} = 115) completed the study. Thirty-three participants were excluded from the study because they did not meet the inclusion criteria regarding the minimum levels of emotional discomfort and believability associated with the identified negative self-referential thought (please see Thought Selection and Assessment Section below). The age of the final participants ranged from 17-48 years (M = 20.52, SD = 4.39). The ethnic composition of the sample was diverse with 45% (n = 66) identifying as “African American,” 27% (n = 39) as “Non-Hispanic European American,” 14% (n = 21) as “Asian American,” 7% (n = 10) as “Hispanic American,” 6% (n = 9) as “other” or “bicultural,” one as a “Native American,” and one missing value on ethnicity background.

Thirty-six participants reported a previous experience of seeking professional psychological services (e.g., medication treatment, psychotherapy, or counseling) for their psychological struggles. Of those, 10 participants reported that they had previously received at least one psychiatric diagnosis. Primary diagnoses of those participants included bipolar disorder (BD; *n* = 4), major depressive disorder (MDD; *n* = 1), generalized anxiety disorder (GAD; *n* = 1), anxiety disorder not otherwise specified (*n* = 1), obsessive compulsive disorder (OCD; *n* = 1), and attention deficit hyperactivity disorder (ADHD; *n* = 2).

Demographic and Screening Form

Following the consent procedure, participants completed a demographic form (i.e., gender, age, & ethnicity) and the Beck Depression Inventory-II (BDI-II) (Beck, Steer, & Brown, 1996). The BDI-II, a self-report measure of depression, is often used as a screening measure for general psychological functioning. As employed by a previous defusion study (Masuda et al., 2010), the study used the mean BDI-II score to approximate the cutoff for selecting a sub-sample of participants with elevated depressive symptoms. It is important to note that the selected sub-sample was comprised of those with elevated depressive symptoms, not those with a clinical diagnosis of a mood disorder (e.g., Major Depressive Disorder).

Thought Selection and Assessment.

Thought selection and assessment were administered by research investigators who were trained by the first author (A.M.). The procedure and instruction of the thought selection were closely scripted. Each participant was given an assessment form and orally instructed to identify one negative self-referential thought that occurs repeatedly and that

they had found disturbing and believable (e.g., “I am not smart”). Participants were then asked to restate the thought in one word (e.g., “idiot”) and rate it in terms of emotional discomfort and believability, using a 100-mm Likert-style visual analog scale. Responses ranged from 0 (not at all uncomfortable) to 100 (very uncomfortable) for the discomfort scale, and from 0 (not at all believable) to 100 (very believable) for the believability scale. The assessment was conducted before and immediately after the intervention. If participants could not come up with a thought that was above 50 on the discomfort and believability scales, they were prompted to identify another negative self-referential thought that was more uncomfortable and believable. Participants, who failed to meet the inclusion criteria after the prompt, were excluded from the study. Participants were not informed of the inclusion criteria, however.

Procedure

Participants were randomly assigned to one of five conditions. The Partial-Defusion and Partial-Distraction conditions consisted of a brief clinical rationale and training. The Full-Defusion and Full-Distraction protocol included an experiential exercise with the identified self-referential thought in addition to the clinical rationale and training. The distraction-based experimental control condition (e.g., reading an article about the rocks of Stonehenge) was added to the study in order to control non-specific factors.

All of these intervention conditions were approximately 5 minutes long and closely scripted. The defusion and distraction conditions in each mode of delivery (i.e., partial and full) were designed to be equal in terms of (a) components, (b) duration, (c) sequence of components, and (d) contents of training (e.g., the use of the word “milk”

highlighting the use of the assigned strategy). Investigators ran participants in all conditions to minimize experimenter effects. A weekly research meeting was held to ensure adherence to the scripted interventions.

Partial-Defusion Condition. This condition consisted of the defusion rationale and defusion training with an emotionally neutral word (i.e., “milk”). The rationale and training were drawn from an ACT manual (Hayes et al., 1999). The rationale included statements of positive and negative characteristics of human verbal activities. The rationale then addressed the automatic and contextual nature of verbal events/processes. To exemplify this, defusion training was then introduced to the participant. In the training, the participant was asked to say the word "milk" once and to notice its perceptual functions (e.g., “white,” “cold”). The participant was then instructed to repeat the word "milk" out loud as rapidly as possible for 20 seconds together with the experimenter and notice what happens to the perceptual functions during the training. Participants typically reported that the meaning of the word disappeared, and noted that more direct functions appeared (e.g., “It became just a sound.”). The experimenter then suggested that this defusion experience could be applicable to the participant’s self-referential negative thought, indicating that negative thoughts are also simply sounds with conventional meanings.

Full-Defusion Condition. First, the participants in the Full-Defusion condition received the defusion rationale and training identical to those employed in the Partial-Defusion condition. The participant was then instructed to repeat the one-word version of the self-referential negative thought (e.g., “idiot”) out loud as rapidly as possible until the experimenter said “stop.” To maintain engagement in the defusion strategy, the

experimenter provided a verbal prompt (i.e., "faster" and "louder") to the participant after 10 and 20 seconds. The experimenter instructed the participant to discontinue the repetition by saying “stop” after 30 seconds passed.

Partial-Distraction Condition. This condition consisted of a thought distraction rationale and training. The rationale and training were drawn from emotion regulation literature (e.g., Gross, 1998) and previous analogue studies (e.g., Cioffi & Holloway, 1993; Masuda et al., 2010). It is important to note that the thought distraction protocols of the present study were not derived from a treatment manual of any specific intervention approach that involves a distraction strategy, such as dialectical behavior therapy (DBT; Linehan, 1993). In the present study, the thought distraction strategy was roughly defined as an effort of moving attention away from a given event altogether by selectively attending to another emotionally less distressing event or situation (Gross, 1998). The thought distraction rationale began with a statement suggesting that cognitions cause actions and emotions, and that negative thoughts are the source of human suffering. The rationale then suggested that distracting oneself from negative thoughts by thinking of something different is a solution. Following the brief rationale, the participant received thought distraction training using the word “milk” and a picture of simple geometric figures (i.e., a circle, triangle). Similar to the defusion condition, the participant was asked to say the word "milk" once and to notice all of its perceptual functions. Then, the participant was instructed not to think of the word “milk” by focusing on the picture of simple geometric figures. The experimenter provided a verbal prompt (i.e., "don’t think about milk") to the participant at five second increments for 20 seconds before telling the

participant to stop. The experimenter then suggested applying this experience to his or her negative self-referential thought in order to prevent psychological discomfort.

Full-Distraction Condition. The participant in the Full-Distraction condition initially received the distraction rationale and training identical to those employed in the Partial-Distraction condition. The participant was then instructed to distract from the target negative self-referential thought by focusing on the picture of geometric shapes until the experimenter said “stop.” The experimenter provided a verbal prompt (i.e., “don’t think about [one-word thought]") to the participant at 10 second increments. The experimenter said "stop" after 30 seconds passed.

Distraction-based Experimental Control Condition. This condition did not include a rationale, training, or experiential exercise. The participant was instructed to read an emotionally neutral article about the rocks of Stonehenge for five minutes.

Effectiveness and Usefulness Measures

Immediately after the completion of the post-intervention assessment, the participant was asked to rate the assigned strategy in terms of effectiveness, feasibility, and intention to use in the future. More specifically, using a 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), the participant answered the following questions: (a) “I found this strategy very effective (i.e., effectiveness),” “I found this strategy easy to use (i.e., feasibility),” and “I will use it again when I have a difficult thought (i.e., intention to use).”

Results

Pre-intervention Group Differences

ANOVAs revealed that the groups did not differ in BDI-II score and pre-intervention emotional discomfort and believability ($Fs < 1.07$, $ps > .37$). ANCOVAs revealed that, while controlling for the dependent variable of interest at pre-intervention, there were no main effects of experimenter in emotional discomfort or believability of negative self-referential thoughts at post-intervention in each experimental condition, ($Fs < 2.09$, $ps > .132$).

With respect to demographic variables, controlling for the intervention condition and the dependent variable of interest at pre-intervention, partial correlations revealed that gender (categorized as 1 = female, 2 = male) or ethnicity background (dichotomized as 1 = Non-Hispanic European American, 2 = Ethnic minority) were not significantly correlated to emotional discomfort and believability of the self-referential negative thought at post-intervention. However, age was found to be significantly and negatively correlated with the dependent variables of interest at post-intervention ($rs < -30$, $p < .001$). Given this set of findings, an ANOVA was conducted to investigate whether the intervention groups significantly differed from one another in the age of participants. Results revealed no significant main effect of intervention group, F (4, 142) = 1.00, $p > .40$.

Effects on Self-Referential Negative Thoughts

The means, standard deviations, and effect sizes of emotional discomfort and believability scores of the negative self-referential thoughts for all conditions are presented in Table 1. The results for the emotional discomfort and believability scores were analyzed separately, using two 5 (condition) by 2 (time) repeated measure ANOVAs.

Emotional Discomfort. Results revealed a main effect for time, $F(1, 142) = 107.95$, $p < .001$, and a two way interaction between condition and time, $F(4, 129) = 9.21$, $p < .001$ (see Figure 1). The interaction was decomposed both by looking at the effects of time across each condition and by looking at the effects of condition at post-intervention. Pairwise comparisons revealed that emotional discomfort at post-intervention was found to be significantly lower than pre-intervention emotional discomfort in all conditions (*t*s > 2.29, *p*s < .05). Effect size analyses revealed a moderate or large within group effect size in all active conditions (see Table 1). A small within effect size was also found in the experimental control condition.

At post-intervention, the Full-Defusion group reported significantly lower levels of emotional discomfort than comparison groups (*ps* < .01). No other significant group differences were found at post-intervention (*ps* > .05). Similarly, effect size analyses revealed a large effect size in the comparisons between the Full-Defusion group and the other four comparison conditions, and a small effect size in the comparison between Partial-Defusion and experimental control groups.

Believability. Results showed a main effect for time, $F(1, 142) = 116.99$, $p < .001$, and a two way interaction between condition and time, $F(4, 142) = 7.39$, $p < .001$ (see Figure 1). Post-intervention believability was significantly lower than pre-intervention believability across all conditions (*t*s > 2.32, *p*s < .05). Effect size analyses also revealed a moderate to large within group effect size across all active intervention conditions. A smaller within group effect size was found in the experimental control group.

At post-intervention, the Full-Defusion group reported significantly lower believability than the other four groups (*ps* < .01). No other significant group differences

were observed at post-intervention (*ps* > .05). Similarly, a large effect size was found in the comparisons between Full-Defusion and the other four conditions. Additionally, in the comparisons between Partial-Defusion and Partial-Distraction conditions, between Partial-Defusion and experimental control group, and between Full-Distraction and experimental control groups, a small effect size was found. These results suggest that at post-intervention, the effect of Partial Defusion on believability was greater than those of Partial-Distraction and experimental control conditions and that the effect of Full-Distraction condition was greater than that of experimental control.

Effects on Individuals with Elevated Depressive Symptoms

The mean score of the BDI-II in 147 participants was 10.85 (*SD* = 7.99). Using the BDI-cut off score of 10, 71 participants (n_{female} = 55) were selected as individuals with *elevated depressive symptoms* (see Table 2). The age of these participants ranged from 17-36 years (*M* = 20.63, *SD* = 4.11). The ethnic composition of the sample was diverse with 41% (*n* = 29) identifying as "African American," 28% (*n* = 20) as "Non-Hispanic European American," 14% (*n* = 10) as "Asian American," 7% (*n* = 5) as "Hispanic American," 8% (*n* = 6) as "other" or "bicultural," and one as a "Native American." Twenty-two participants reported a previous experience of seeking professional psychological service, and six of them reported that they previously received at least one psychiatric diagnosis. The primary psychiatric diagnosis included BD (*n* =3), MDD (*n* = 1), GAD (*n* = 1), and OCD (*n* = 1). ANOVAs revealed that pre-intervention emotional discomfort and believability and BDI-II scores did not differ significantly by group (*Fs* < 1.05, *ps* > .38).

Emotional Discomfort. A 5 (condition) by 2 (time) repeated measure ANOVA revealed the main effect for time, $F(1, 66) = 53.77$, $p < .001$, and a two way interaction between condition and time, $F(4, 66) = 7.35$, $p < .001$. Pairwise comparisons revealed a significant reduction of emotional discomfort at post-treatment as compared to pre-treatment in all groups (*ps* < .05), except for the control group. Similarly, effect size analyses revealed a moderate to large within-group effect size among the four active intervention conditions.

At post-intervention, the Full-Defusion group reported significantly lower levels of emotional discomfort than the other four groups (*ps* < .01). No other significant group differences were observed at post-intervention (*ps* > .05). Furthermore, effect size analyses revealed a large effect size in the comparisons between Full-Defusion and the other four conditions, and a small effect size in the comparison between the experimental control and three other active conditions (i.e., Partial-Defusion, Partial-Distraction, and Full-Distraction).

Believability. A 5 (condition) by 2 (time) repeated measure ANOVA showed a main effect for time, $F(1, 66) = 55.05$, $p < .001$, and a two way interaction between condition and time, $F(4, 66) = 5.23$, $p < .01$. Once again, pairwise comparisons revealed a significant reduction of believability at post-treatment as compared to pre-treatment in all conditions (*ps* < .05), except for the control condition. Results of effect size analyses were consistent with those of statistical significance, revealing a moderate to large within group effect size across all active conditions and a small within group effect size in the experimental control group.

At post-intervention, the Full-Defusion group reported significantly lower levels of believability than the Partial-Distraction and control groups (*ps* < .05). No other significant group differences were found at post-intervention believability (*ps* > .05). Somewhat consistent with the findings of statistical significance, effect size analyses revealed a moderate to large effect size in the comparisons between Full-Defusion and the four comparison conditions. A small to moderate effect size of Partial Defusion was found when compared to the two distraction conditions and experimental control condition. Finally, a small effect size was found in the comparisons between the two distraction condition, and between Full-Distraction and experimental control.

Exploratory Analyses on the Role of Depressive Symptoms

Because similar patterns were found between the overall participant group and the subgroup with elevated depressive symptoms, the role of depressive symptoms (i.e., BDI-II scores) was investigated further. Using the overall sample of 147 participants, a hierarchical regression analysis was conducted separately for each post-intervention outcome variable. In the analysis, the BDI-II score was entered in the first step, followed by the variable of interest at pre-intervention and the intervention condition (i.e., dummy coded) in the second step. Results revealed that depressive symptomatology was a predictor of emotional discomfort at post-intervention (β = .19, t = 2.35, p = .02). However, when emotional discomfort at pre-intervention and intervention condition were taken into consideration, depressive symptomatology was no longer a significant predictor (β =.09, t = 1.14, p > .25). Depressive symptomatology was not found to be a predictor of believability at post-intervention (β =.07, t = -.86, p = .39).

Usefulness Measures

A series of ANOVAs revealed main effects of the intervention condition in effectiveness, feasibility, and intention to use ratings (Fs > 2.90, ps < .05). In the effectiveness rating, both Partial- and Full-Defusion conditions were rated more effective than the Partial- and Full-distraction conditions and the control condition (ps < .01). With respect to feasibility, the Partial-Defusion protocol was found to be more feasible than the Partial- and Full-Distraction conditions and the control condition (p < .01). In addition, the Full-Defusion condition was rated more feasible than the Partial- and Full-Distraction conditions (p < .05). Regarding the intention to use, participants in the Partial-and Full-Defusion conditions reported that they would use the assigned strategy in the future more so than those in the Partial Distraction and control conditions (p <. 05).

Discussion

The study has shown the additive effect of experiential exercise with a target negative self-referential thought by systematically manipulating the mode of intervention delivery. The Full-Defusion protocol that contains a clinical rationale, training, and experiential exercise, reduces emotional discomfort and believability of negative self-referential thought more so than thought distraction strategies and the defusion strategy that contains the clinical rationale and training only (i.e., Partial-Defusion). The latter finding is particularly interesting because the participants in the Full- and Partial-Defusion conditions perceived their assigned protocols to be equally effective. Additionally, results suggest that the Full-Defusion protocol is effective even among participants with elevated depressive symptoms and that its positive impact can be independent of the level of depressive symptoms.

The present study has two notable clinical implications. Results of the study suggest that it is important to include an experiential component in cognitive defusion intervention. Whereas it is crucial to establish a verbal context that promotes the acquisition of cognitive defusion (Masuda et al., 2009), a clinical rationale and training may not be sufficient for altering the stimulus function of target private events. As suggested by Hayes and colleagues (1999), the inclusion of an experiential component, in the combination with clinical rationale and training, seems to maximize its effect.

A second implication is that the present defusion strategy can be applicable to diverse clients with a wide range of symptom severity. As speculated elsewhere (Masuda et al., 2010), a long-term effect of rapid word repetition is unlikely. However, the defusion strategy seems to be effective, regardless of symptom severity, to learn experientially what it is likely to be defused from difficult thoughts *at least temporarily*. Clinically, the defusion strategy can be used for introducing a perspective and experience of cognitive defusion and for establishing a context that promotes the acquisition of cognitive defusion.

The present study has several theoretical implications. In recent years, there have been heated conceptual debates about whether acceptance- and defusion-based strategies are fundamentally different from conventional coping strategies, such as control and distraction techniques (e.g., Arch & Craske, 2008; Hofmann & Asmundson, 2008). Although there is no consensus, literature suggests that the two strategies may be fundamentally different from each other, given the differential effects on the contexts where they are employed (e.g., McCaul, Monson, & Maki, 1992). In a previous study (Gutierrez, Luciano, Rodriguez, & Fink, 2004), the superiority of an acceptance strategy

over a distraction strategy emerged in a greater levels of pain, while both strategies were equally effective in lower levels of pain. The present study extends this knowledge by suggesting that the differential effects between the two strategies may also be moderated by the mode of intervention delivery. When the intervention protocol contains only a clinical rationale and training, the differential effects are unlikely or small. However, the superiority of the defusion strategy seems to emerge when the protocols include an experiential component with target private events, combined with a clinical rationale and training.

In the present study, the Full-Distraction protocol was found to be no more effective or slightly more effective than the experimental control conditions. The set of findings is somewhat surprising because a previous study (Masuda et al., 2010) shows that the full distraction strategy is an effective strategy in reducing emotional discomfort and believability of negative self-referential thought, although its effects are smaller than those of the full defusion protocol. Although the exact nature of these differential effects is unclear, the differences may be in part because of methodological variability in the two studies. In the previous study, the participants in the distraction condition were allowed to freely choose the stimulus used for distracting them from their negative self-referential thoughts. Given the procedure, the participants might have been able to engage in a distraction strategy that was already in their behavioral repertoire (e.g., focusing on a positive image in their mind, thinking of upcoming events). On the other hand, the stimulus used for the present distraction (i.e., a picture of geometric figures) was systematically controlled to increase the methodological rigor. As the effectiveness and feasibility ratings show, it is speculated that the methodological rigor employed by the

present study might have hindered the ecological and practical value of the distraction strategy, diminishing its positive effects.

Consistent with Masuda et al. (2010), much greater variability (*SD*s) of discomfort and believability scores is seen at post-intervention, relative to those at pre-intervention. These results clearly reveal that there were larger inter-individual differences at post-intervention, suggesting the varying effects of interventions across participants. Investigating factors that may account for the variability, such as the content of negative self-referential thought, pre-intervention levels of emotional discomfort and believability, existing repertoire of cognitive defusion and associated processes, general psychological functioning, one's verbal community, and demand characteristics, is an avenue for future study.

Methodologically, it is speculated that the Full-Distraction protocol might have operated as a suppression strategy. Although the participant was clearly instructed to pay attention to the picture of the geometric figures prior to the experiential exercise, the verbal prompt used for the Full-Distraction condition during the experiential exercise was "don't think about it," which is closely related to a thought suppression strategy more so than a distraction method. Additionally, the perceived ineffectiveness of the assigned distraction strategy might have shifted the participant to a thought suppression method in response to the target self-referential thought.

The present study has other limitations. The study did not examine the impact of actual repetition of the target thought alone. Literature on semantic satiation (Esposito & Pelton, 1971) suggests that word repetition without a rationale is unlikely to produce favorable effects. Each of the outcome variables was assessed by a single measure (i.e.,

100-mm scale), which may inflate the effect sizes of interventions. Furthermore, similar to previous analogue experiments, the study did not include follow-up assessments. The goal of the defusion exercise is to simply help clients experientially realize that the psychological impact of even difficult private events is contextually controlled, not necessarily to reduce discomfort and believability in the long run. For this reason, follow-up assessments may not be necessary.

Yet another concern is the use of face-to-face format in delivering active interventions. Previous analogue studies (e.g., McMullen et al., 2008) employed a computerized program or audio-taped intervention in order to systematically control and manipulate the variables of interest. The current investigation employed a contact-based face-to-face format, a less stringent mode of intervention, in order to maintain a therapeutic atmosphere in an analogue setting. It appears important for future studies to optimize the balance between methodological rigor, practical utility, and generalizability of findings.

Finally, perhaps the major limitation of the present study is the exclusive reliance on self-report measures. From an ACT perspective, discomfort and believability of private events are part of functional processes, and they should be studied within the context of ongoing stimulus-behavior relations. Self-report type methods do not measure these processes directly. Although it is difficult to directly assess the stimulus function of the negative self-referential thoughts, the development of a behavioral method that captures the function of self-referential thoughts seems extremely important.

In sum, despite these limitations, the present investigation is the first study suggesting that an experiential component plays an important role in altering the stimulus

function of negative self-referential thoughts. Additionally, the study suggests that, when delivered with a clinical rationale, training, and experiential exercise, the defusion strategy is effective regardless of the level of depressive symptoms in a non-clinical sample. The present findings are encouraging, and further investigation on the process and effects of cognitive defusion and other coping strategies seems warranted.

References

Arch, J. J., & Craske, M. G. (2008). Acceptance and commitment therapy and cognitive behavioral therapy for anxiety disorders: Different treatments, similar mechanisms? *Clinical Psychology: Science and Practice, 15,* 263-279.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive Therapy of Depression.* New York: The Guilford Press.

Beck, A.T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory-Second Edition (BDI-II).* San Antonio, TX: The Psychological Corporation.

Campbell-Sills, L., Barlow, D. H., Brown, T. A., & Hofmann (2006). Effects of suppression and acceptance on emotional responses of individuals with anxiety and mood disorders. *Behaviour Research and Therapy, 44,* 1251-1263.

Cioffi, D., & Holloway, J. (1993). Delayed costs of suppressed pain. *Journal of Personality and Social Psychology, 64,* 274–282.

Eifert, G. H., & Heffner, M. (2003). The effects of acceptance versus control contexts on avoidance of panic-related symptoms. *Journal of Behavior Therapy and Experimental Psychiatry, 34,* 293-312.

Esposito, N. J., & Pelton, L. H. (1971). Review of the measurement of semantic satiation. *Psychological Bulletin, 75,* 330-346.

Feldner, M. T., Zvolensky, M. J., Eifert, G. H., & Spira, A. P. (2003). Emotional avoidance: an experimental test of individual differences and response suppression using biological challenge. *Behaviour Research and Therapy, 41,* 403-411.

Fisher, P. L., & Wells, A. (2005). Experimental modification of beliefs in obsessive–compulsive disorder: A test of the metacognitive model. *Behaviour Research and Therapy, 43*, 821-829.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2,* 271-299.

Gutiérrez, O., Luciano, C., Rodríguez, M., & Fink, B. C. (2004). Comparison between an acceptance-based and a cognitive-control-based protocol for coping with pain. *Behavior Therapy, 35,* 767-784.

Hayes, S. C., Follette, V. M., & Linehan, M. M. (Eds.) (2004). *Mindfulness and acceptance: Expanding the cognitive behavioral tradition.* New York: Guilford Press.

Hayes, S. C., Luoma, J., Bond, F., Masuda, A., & Lillis, J. (2006). Acceptance and Commitment Therapy: Model, processes, and outcomes. *Behaviour Research and Therapy, 44,* 1-25.

Hayes, S. C. Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An experiential approach to behavior change.* New York: Guilford Press.

Healy, H., Barnes-Holmes, Y., Barnes-Holmes, D., Keogh, C., Luciano, C., & Wilson, K. (2008). An experimental test of a cognitive defusion exercise: Coping with negative and positive self-statements. *The Psychological Record, 58,* 623-640.

Hofmann, S. G., & Asmundson, G. J. (2008). Acceptance and mindfulness-based therapy: New wave or old hat? *Clinical Psychology Review, 28,* 1-16.

Levitt, J. T., Brown, T. A., Orsillo, S. M., & Barlow, D. H. (2004). The effects of acceptance versus suppression of emotion on subjective and psychophysiological response to carbon dioxide challenge in patients with panic disorder. *Behavior Therapy, 35,* 747-766.

Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder.* New York: The Guilford Press.

Liverant, G. I., Brown, T. A., Barlow, D. H., & Roemer, L. (2008). Emotion regulation in unipolar depression: The effects of acceptance and suppression of subjective emotional experience on the intensity and duration of sadness and negative affect. *Behaviour Research and Therapy, 46,* 1201-1209.

Masuda, A., Hayes, S. C., Sackett, C. F., & Twohig, M. P. (2004). Cognitive defusion and self-referential negative thoughts: Examining the impact of a ninety year old technique. *Behaviour Research and Therapy, 42,* 477-485.

Masuda, A., Hayes, S. C., Twohig, M. P., Drossel C., Lillis, J., & Washio, Y. (2009). A parametric study of cognitive defusion and the believability and discomfort of negative self-referential thoughts, *Behavior Modification, 33,* 250-262.

Masuda, A., Twohig, M. P., Stormo, A. R., Feinstein, A. B., Chou, Y., & Wendell, J. W. (2010). The effects of cognitive defusion and thought distraction on emotional discomfort and believability of negative self-referential thoughts. *Journal of Behavior Therapy and Experimental Psychiatry, 41,* 11-17.

McCaul, K. D., Monson, N., & Maki, R. H. (1992). Does distraction reduce pain-produced distress among college students? *Health Psychology, 11,* 210-217.

McMullen, J., Barnes-Holmes, D., Barnes-Holmes, Y., Stewart, I., Luciano, C., & Cochrane, A. (2008). Acceptance versus distraction: Brief instructions, metaphors and exercises in increasing tolerance for self-delivered electric shocks. *Behaviour Research and Therapy, 46,* 122-129.

Ryff, C. D., & Keys, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69,* 719-727.

Segal, Z. V., Teasdale, J. D., & Williams, J. M. G. (2004). Mindfulness-based cognitive therapy: Theoretical rationale and empirical status. In S. C. Hayes, V. M. Follette, & M. M. Linehan (Eds.), *Mindfulness and acceptance: Expanding the cognitive behavioral tradition* (pp. 45-65). New York: Guilford Press.

Titchener, E. B. (1910). *A text-book of psychology.* New York: MacMillan.

Table 1

Average Scores, Standard Deviations, and Effect Sizes of Emotional Discomfort and Believability of Negative Self-Referential Thoughts by Condition and Time

	Emotional Discomfort			Believability		
Conditions:	Pre	Post	Pre-Post within *d*	Pre	Post	Pre-Post within *d*
1. Partial Defusion (*n* = 27)	79.67 (12.76)	62.85 (25.26)	.91	82.11 (17.73)	60.81 (29.37)	.95
2. Full Defusion (*n* = 30)	79.17 (11.96)	39.53 (24.91)	1.57	74.93 (13.51)	38.87 (21.99)	1.57
3. Partial Distraction (*n* = 26)	78.58 (12.37)	66.73 (14.95)	.70	81.00 (12.72)	66.73 (19.00)	.99
4.Full Distraction (n = 33)	80.94 (11.09)	65.75 (19.87)	.98	78.09 (15.49)	63.79 (20.39)	.77
5. Control (n = 31)	78.32 (13.64)	68.52 (23.43)	.44	77.94 (13.16)	68.94 (24.83)	.47
Between Condition Cohen's *d*						
Condition 1 vs. Condition 2		.93			.85	
Condition 1 vs. Condition 3		-.19			-.25	
Condition 1 vs. Condition 4		-.13			-.12	
Condition 1 vs. Condition 5		-.23			-.30	
Condition 2 vs. Condition 3		-1.37			-1.40	
Condition 2 vs. Condition 4		-1.17			-1.18	
Condition 2 vs. Condition 5		-1.20			-1.28	
Condition 3 vs. Condition 4		.06			.15	
Condition 3 vs. Condition 5		-.09			-.10	
Condition 4 vs. Condition 5		-.13			-.23	

Table 2

Average Scores, Standard Deviations, and Effect Sizes of Emotional Discomfort and Believability of Negative Self-Referential Thoughts and Beck Depression Inventory-II by Condition and Time among Participants with Elevated Depressive Symptoms

	Emotional Discomfort			Believability			BDI-II
Conditions:	Pre	Post	Pre-Post within *d*	Pre	Post	Pre-Post within *d*	
1. Partial Defusion (*n* = 11)	85.18 (10.83)	67.45 (28.03)	.93	83.36 (16.23)	56.91 (33.65)	1.25	18.18 (10.81)
2. Full Defusion (*n* = 12)	79.00 (11.79)	33.42 (28.39)	1.61	75.92 (15.14)	38.50 (21.10)	1.32	16.25 (6.55)
3. Partial Distraction (*n* = 17)	79.76 (13.07)	67.47 (15.56)	.65	81.35 (14.59)	68.35 (18.01)	.82	16.82 (7.21)
4.Full Distraction (n = 16)	84.56 (12.12)	68.13 (23.06)	1.07	77.88 (16.03)	64.13 (24.43)	.66	16.37 (3.94)
5. Control (n = 15)	77.47 (13.91)	75.20 (18.63)	.16	73.60 (13.22)	70.33 (19.14)	.36	18.00 (7.43)
Between Condition Cohen's *d*							
Condition 1 vs. Condition 2		1.21			.67		
Condition 1 vs. Condition 3		-.00			-.44		
Condition 1 vs. Condition 4		-.03			-.25		
Condition 1 vs. Condition 5		-.33			-.51		
Condition 2 vs. Condition 3		-1.56			-1.53		
Condition 2 vs. Condition 4		-1.35			-1.13		
Condition 2 vs. Condition 5		-1.78			-1.58		
Condition 3 vs. Condition 4		-.03			.20		
Condition 3 vs. Condition 5		-.45			-.11		
Condition 4 vs. Condition 5		-.34			-.29		

Note: BDI-II = Beck Depression Inventory-II

Table 3

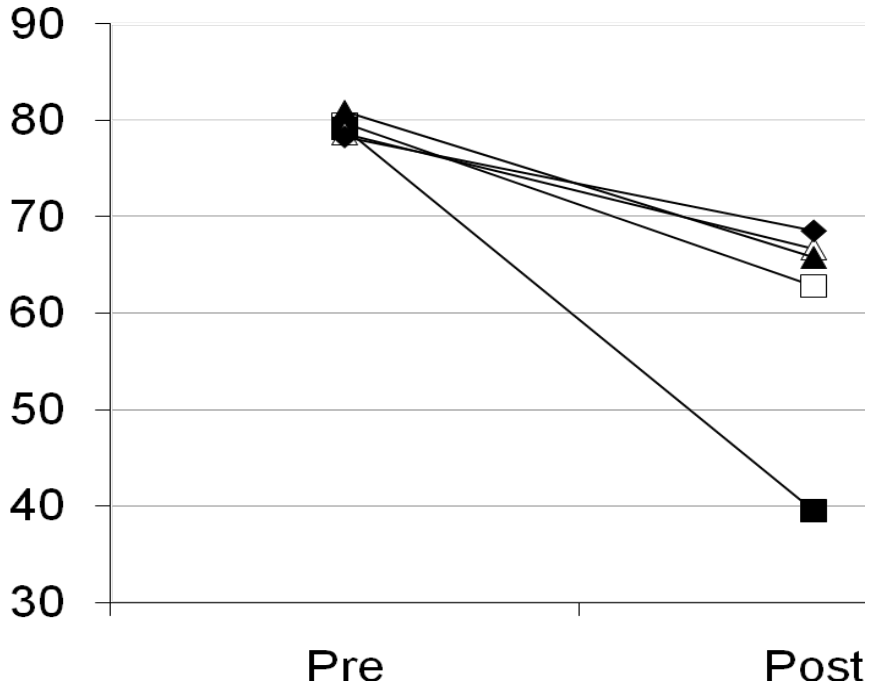
Means and Standard Deviations for Ratings of Perceived Effectiveness, Ease, and Intention to Use Assigned Strategy.

	Effectiveness	Easy to Use	Intention to Use
Partial Defusion (*n* = 27)	5.26 (1.23)	6.41 (.84)	5.48 (1.45)
Full Defusion (*n* = 30)	5.67 (1.47)	5.87 (1.54)	5.43 (1.74)
Partial Distraction (*n* = 26)	3.96 (1.61)	4.84 (2.09)	4.23 (1.90)
Full Distraction (*n* = 33)	3.91 (1.63)	5.03 (1.42)	4.27 (1.66)
Control (*n* = 31)	4.10 (1.90)	5.26 (1.98)	4.23 (2.06)

Figure Caption

Figure 1. Means of emotional discomfort and believability of negative self-referential thoughts at pre and post by condition.

Emotional Discomfort



Believability