An Experimental Comparison of Techniques: Cognitive Defusion, Cognitive Restructuring, and in-vivo Exposure for Social Anxiety

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Background: One of the primary differences between Cognitive Behavioral Therapy (CBT) and Acceptance and Commitment Therapy (ACT) for anxiety is the approach to managing negative thoughts. CBT focuses on challenging the accuracy of dysfunctional thoughts through cognitive restructuring exercises, whereas ACT attempts to foster acceptance of such thoughts through cognitive defusion exercises. Previous research suggests that both techniques reduce the distress associated with negative thoughts, though questions remain regarding the benefit of these techniques above and beyond exposure to feared stimuli. **Aims:** In the present study, we conducted a brief experimental intervention to examine the utility of cognitive defusion + in-vivo exposure, cognitive restructuring + in-vivo exposure, and in-vivo exposure alone in reducing the impact of negative thoughts in patients with social anxiety disorder. **Method:** All participants completed a brief public speaking exposure and those in the cognitive conditions received training in the assigned cognitive technique. Participants returned a week later to

complete a second exposure task and self-report measures. **Results:** All three conditions resulted in similar decreases in discomfort related to negative thoughts. ANOVA models failed to find an interaction between change in accuracy or importance and assignment to condition in predicting decreased distress of negative thoughts. **Conclusions:** These preliminary results suggest that changes in perceived importance and accuracy of negative thoughts may not be the mechanisms by which cognitive defusion and cognitive restructuring affect distress in the short-term.

Keywords: Cognitive defusion, cognitive restructuring, exposure, social anxiety disorder

Introduction

Cognitive behavioral therapy (CBT) and acceptance and commitment therapy (ACT) are evidence-based treatments for anxiety disorders, including social anxiety disorder (SAD). CBT and ACT share commonalities including exposure to feared stimuli and identification of negative thoughts; however, differences arise in specific strategies used to manage negative thoughts. Whereas CBT focuses on challenging the accuracy of dysfunctional thoughts through cognitive restructuring, ACT attempts to foster acceptance of such thoughts through cognitive defusion. However, proponents of CBT suggest that cognitive restructuring also emphasizes the defusion of negative thoughts from reality, and cognitive defusion has been identified as a mediator of treatment outcome in both CBT and ACT (Arch, Wolitzky-Taylor, Eiffert and Craske, 2012).

Research examining mechanisms by which cognitive restructuring and cognitive defusion effect change is needed to examine whether these techniques differ, and how they can be used to maximize clinical efficacy. Although no studies have directly compared cognitive restructuring and cognitive defusion in clinical anxiety samples, a handful of analogue studies provide preliminary data on this topic (Mausada, Hayes, Sackett and Twohig, 2004; Deacon, Fawzy, Lickel and Wolitzky-Taylor, 2011). However, these studies lack comparison to a behavioral control condition, an important comparison given data suggesting cognitive interventions may provide no additional benefit to behavioral techniques (Longmore and Worrell, 2007).

The present study used a brief experimental design to examine the utility of cognitive defusion + in-vivo exposure (CD+Exp), cognitive restructuring + in-vivo exposure (CR+Exp), and in-vivo exposure alone (Exp) in reducing the impact of negative thoughts in patients with SAD. We predicted that (1) all conditions would result in significant reductions in distress associated with negative thoughts from pre-to post-intervention, and (2) decreases in perceived accuracy of negative thoughts would be associated with decreased distress in the CR+Exp condition, whereas decreases in perceived importance of negative thoughts would be associated with decreased distress in the CD+Exp condition.

Method

Participants

Participants were 41 adults diagnosed with SAD who reported a fear of public speaking and agreed to participate in this brief experimental study prior to enrolling in group CBT [56.1% male, mean age of 29 years ($SD = 5.5$; range 19–41), 53.7% White].

Measures

The Self-Relevant Negative Thought Assessment (SRNTA; Masuda et al., 2004), is a 3-item measure directing participants to generate one specific negative automatic thought associated with social situations. Participants rated the following questions: 1) "How uncomfortable is the thought?" (distress), 2) "To what extent do you believe this thought accurately describes you?" (accuracy), and 3) "How important is it to you not to have this thought?" (importance) on a 100-mm visual analogue scale. Distress before, during, and after the exposure task was measured using the Subjective Unit of Distress Scale (SUDS; Wolpe and Lazarus, 1967) ranging from 0 (no distress) to 100 (worst possible distress). No measure of SAD symptoms was included as we did not expect significant change to occur following this brief experimental study.

Procedure

Participants were randomly assigned to one of three conditions: CD+Exp (*n* = 15), CR+Exp (*n* = 15) or Exp (*n* = 11) and were asked to attend two sessions approximately one week apart. During Session 1, participants completed the SRNTA and a 5-minute formal speaking task in front of three people. Participants in the CD+ExpandCR+Exp conditions then completed a 30-minute training and were asked to practice the skill daily for one week. Participants in the Exp condition did not complete homework. All participants completed the SRNTA again at the end of Session 1 and at the beginning of Session 2. Participants completed a second 5-minute public speaking exposure during Session 2.

The defusion exercise was adapted from Masuda et al. (2004). Cognitive defusion was introduced, and the "milk exercise" was used to illustrate the process of accepting ones' thoughts as mere thoughts. Participants described their thoughts related to the word "Milk", and then repeated the word "Milk" for 60 seconds with the therapist. Therapists then asked participants to evaluate what happened to the meaning of the word "Milk". Frequent answers indicated that "Milk" became a word comprised of phonological sounds rather than holding meaning. Participants then applied this technique using socially anxious thoughts (e.g. "Weird"), with a word identified by the participant while completing the SRNTA at the beginning of Session 1.

The restructuring exercise was adapted from a CBT manual for SAD (Hope, Heimberg and Turk, 2006). Participants were informed that automatic thoughts adversely impact feelings and behaviors and are often inaccurate, exaggerated and/or maladaptive. A situational example of formal speaking was used to highlight common automatic thoughts (e.g. "People will think I am weird") along with unpleasant emotions and avoidant behaviors in social anxiety. The example examined evidence for and against each interpretation, and also underscored differences in affect as they related to competing interpretations of the event. With the help of therapists, participants completed their own cognitive restructuring using the automatic thought identified on the SRNTA at the beginning of Session 1.

Results

Thirty-two participants completed ratings at all three time points (pre-session 1, post-session 1, and pre-session 2), and were included in analyses. No differences in attrition were observed

Table 1. Descriptive statistics and between-group comparisons

Measure	Cognitive defusion M (SD) n = 12	Cognitive restructuring M (SD) n = 13	Exposure M (SD) n = 7	Main effect of time	Main effect of condition	Time x condition interaction
Mid SUDS				–	–	–
Exposure 1	64.17 (20.32)	61.92 (14.51)	55.86 (23.31)			
Exposure 2	66.09 (18.91)	55.77 (15.79)	46.71 (23.71)			
Distress				5.23**	0.62	0.19
Pre-session 1	80.75 (13.95)	75.69 (19.48)	82.43 (17.16)			
Post-session 1	69.33 (14.93)	65.85 (19.87)	72.57 (29.80)			
Post-homework	73.08 (16.71)	63.00 (25.97)	71.14 (24.29)			
Accuracy				4.98*	0.22	2.45±
Pre-session 1	66.00 (29.94)	70.08 (27.49)	67.71 (39.02)			
Post-session 1	58.17 (26.87)	49.92 (28.67)	67.14 (35.19)			
Post-homework	65.33 (34.08)	53.15 (33.54)	64.57 (35.20)			
Importance				2.94±	0.77	0.80
Pre-session 1	84.75 (11.93)	86.62 (14.47)	78.57 (34.50)			
Post-session 1	83.42 (14.27)	83.15 (12.25)	73.71 (30.58)			
Post-homework	71.08 (27.75)	83.69 (12.96)	69.29 (39.00)			

Note: Greenhouse-Geisser estimates were used to correct for violation of the sphericity assumption in the accuracy ($\varepsilon = .88$) and importance ($\varepsilon = .73$) models.
$\pm p < .10$; $^{*}p < .05$; $^{**}p < .01$.

by condition, $\chi 2$ $(2, N = 41) = 0.79$, $p = .674$. At baseline, groups did not differ on measures of discomfort, accuracy, or importance (see Table 1). An ANCOVA tested for group differences in SUDS reported mid-way through the second exposure, controlling for SUDS reported mid-way through the first exposure. SUDS did not differ between conditions, $F_{(2,28)} = 1.85$, $p = .176$.

To test hypotheses about group differences in discomfort, accuracy, and importance over session 1, and between sessions 1 and 2, six repeated-measures ANOVAs were used with a within-subjects factor of time (pre- vs. post-session 1 or pre-session 1 vs. post-homework) and a between-subjects factor of condition (CR+Exp, CD+Exp, Exp; see Table 1). We did not control for Type I error given the small sample size. Effect sizes determined the magnitude of improvement within each group and between cognitive and exposure conditions. The distress models both revealed effects of time, but not for condition nor time by condition interaction. Similarly, effect sizes suggested that all three conditions evidenced moderate reductions in distress from session 1–2 (range in d's = 0.54 to 0.66). Between-group effect sizes were negligible (d's = 0.01 and 0.11).The accuracy models revealed a significant effect of time from pre- to post-session 1, but not from session 1–2. Both models found non-significant effects for condition and time by condition interaction. However, effect sizes revealed a moderate effect for only CR+Exp following homework ($d = 0.62$), and between-group effect sizes favored CR+Expover Exp ($d = -0.54$) in reducing accuracy. Finally, both importance models found no effects for time, condition, nor time by condition interaction. Effect sizes revealed large decreases in importance for CD+Exp after homework ($d = 1.15$), and small

decreases for CR+Expand Exp ($d = 0.21$ and 0.27). Between-group effect sizes yielded a large effect for CD+Expover Exp ($d = -0.88$) following homework.

We next tested whether change in accuracy or importance predicted distress using general linear models. In each model, we investigated interactions between condition and degree of change in either importance or accuracy; non-significant interactions were subsequently dropped. First, we examined change in accuracy over session 1 and condition in predicting distress at the end of session 1, controlling for initial distress. No interaction was found between change in accuracy and condition. The omnibus model was significant, $F_{(4,34)} = 4.22$, $p = .007$, with distress at baseline ($p = .011$) and change in accuracy over session 1 ($p = .003$) both predicting distress at post-session 1. The effect of condition was not significant ($p = .582$). We then examined change in importance and condition in predicting distress at the end of session 1, controlling for initial distress. No interaction was found between condition and change in importance, resulting in removal of this term. The final model was significant, $F_{(4,34)} = 3.41$, $p = .019$, and only change in importance ($p = .009$) predicted distress at post-session 1.

Next, we examined whether change in accuracy or importance from pre-session 1 to session 2 predicted distress at session 2, controlling for initial distress. No significant interaction was found between change in accuracy and condition. The omnibus model was significant, $F_{(4,28)} = 7.73$, $p < .001$, with initial distress ($p < .001$) and change in accuracy ($p = .037$) both predicting session 2 distress. The effect of condition was not significant ($p = .909$). We similarly examined the relation between change in importance and condition in predicting session 2 distress. No interaction was found between condition and change in importance. The omnibus model was again significant, $F_{(4,28)} = 5.66$, $p = .002$, and only initial distress ($p < .001$) predicted distress at session 2.

Discussion

This study compared the effects of brief cognitive (cognitive restructuring and cognitive defusion) and behavioral (in-vivo exposure) techniques in reducing distress among patients with SAD. With regard to distress experienced during public speaking, differences in SUDS ratings during the second exposure were not significant between groups. As hypothesized, participants in all conditions experienced similar decreases in distress associated with negative thoughts, suggesting that while CD+Exp and CR+Exp performed equally, neither was superior to Exp alone.

Examination of the proposed mechanisms of the cognitive techniques (changes in accuracy and importance of negative thoughts) revealed that all conditions evidenced decreases in perceived accuracy and suggested a non-significant trend toward differences between conditions ($p = .067$). Effect sizes revealed that CR+Exp participants demonstrated moderate improvements in perceived accuracy following homework, and that the effect on accuracy ratings was greater for CR+Exp than for Exp. Conversely, effect sizes suggested that only CD+Exp participants demonstrated large improvements in importance of negative thoughts following homework, and between-group effects indicated a benefit of CD+Exp over Exp in this domain. Despite this, and in contrast to Deacon et al. (2011), the models failed to find an interaction between change in accuracy or importance and condition in predicting decreased distress. The small sample, however, likely limited power to detect significance in some analyses and replication is needed. The reliance on single item outcome measures is

an additional limitation. Importantly, this study examined two cognitive techniques in a brief experimental design, and was not intended to test the efficacy of full ACT or CBT protocols, nor evaluate long-term outcomes of SAD.

Our results suggest that cognitive defusion, cognitive restructuring, and in-vivo exposure exercises result in similar decreases in discomfort related to socially anxious thoughts. Findings also suggest that reductions in perceived importance and accuracy of automatic thoughts may not be the mechanisms by which cognitive defusion and cognitive restructuring affect distress in the short-term. Future studies should examine the long-term impact of these techniques and assess cognitive mechanisms in full packages of CBT and ACT for SAD.

Acknowledgements

References

Arch, J. J., Wolitzky-Taylor, K. B., Eiffert, G. H. and Craske, M. G. (2012). Longitudinal treatment mediation of traditional cognitive behavioral therapy and acceptance and commitment therapy for anxiety disorder. *Behaviour Research and Therapy*, *50*, 469–478.

Deacon, B. J., Fawzy, T. I., Lickel, J. J. and Wolitzky-Taylor, K. B. (2011). Cognitive defusion versus cognitive restructuring in the treatment of negative self-referential thoughts: an investigation of process and outcome. *Journal of Cognitive Psychotherapy: An International Quarterly*, *25*, 218–232.

Hope, D. A., Heimberg, R. G. and Turk, C. L. (2006). *Managing Social Anxiety: a cognitive-behavioral therapy approach (therapist guide).* New York: Oxford University Press.

Longmore, R. J. and Worrell, M. (2007). Do we need to challenge thoughts in cognitive behavior therapy? *Clinical Psychology Review*, *27*, 173–187.

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

Wolpe, J. and Lazarus, A. A. (1967). *Behavior Therapy Techniques: a guide to the treatment of neuroses.* New York: Pergamon Press.