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

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**Abstract**

**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 acceptanceof 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 clinical 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.**Methods:**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 conditionsresulted 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 results suggest thatchanges 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

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

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

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

The present study useda brief experimental designto 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 social anxiety disorder (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.

**Methods**

**Participants**

Participants were 41 adults diagnosed with SAD(as assessed by doctoral level students using the Anxiety Disorder Interview Schedule for DSM-IV; Brown et al., 1994), who reported a fear of public speaking. Participants were recruited from a university based outpatient anxiety disorder clinic and provided informed consent to participate in this brief experimental study prior to enrolling in cognitive behavioral group therapy for anxiety. There were no exclusion criteria for the current study. The sample consisted of 23 males and 18 females with a mean age of 28.73 (*SD* = 5.50; range 19-41). The vast majority of individuals (*n* = 34, 82.9%) described themselves as single. The sample was ethnically diverse with 22 (53.7%) individuals describing themselves as White, 7 (17.1%) as at African American, 6 (14.6%) as Asian American, 4 (9.8%) as Hispanic, 1 (2.4%) as Middle Eastern and 1 (2.4%) as Multi-Racial. Nearly two thirds of participants (61%) were diagnosed with comorbid psychiatric disorders. The most common comorbid diagnoses were generalized anxiety disorder (41%) and depressive disorders (37%). Additional diagnoses included panic disorder (12%), obsessive-compulsive disorder (7%), alcohol/substance dependence (5%), specific phobia (2%), impulse control disorder (2%), hypochondriasis (2%), and anxiety disorder not otherwise specified (2%). Finally, 19 individuals (46.3%) reported that they were currently taking psychotropic medications.

**Measures**

 The Self-Relevant Negative Thought Assessment (SRNTA; Masudaet 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& Lazarus, 1967)rangingfrom 0 (no distress) to 100 (worst possible distress).

**Procedure**

Participants were randomly assigned to one of three conditions: CD+Exp (*n* = 15), CR+Exp(*n* = 15) orExp(*n* = 11) and were asked to attend two sessions approximately one week apart. During Session 1, participants completed the SRNTA and a five-minute formal speaking task in front of three people. Participants in the CD+ExpandCR+Expconditionsthen 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 SRNTAagain at the end of Session 1 and at the beginning of Session 2. Participants completed a second five-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 illustratethe process of accepting ones’ thoughts as mere thoughts. Participants described their thoughts related to the word “Milk”, and thenrepeated 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 exercisewas adapted a CBT manual for SAD (Hope, Heimberg, & Turk, 2006). Participants were informed that automatic thoughts adversely impact feelings and behaviorsare 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, andalso 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 SRNTAat the beginning of Session 1.

**Results**

Thirty-two participants completed ratings at all three timepoints (pre session 1, post session 1, and pre session 2), and were included in analyses.No differences in attrition were observed by condition, *χ*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 (prevs. 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). Effect sizes determined the magnitude of improvement within each group and between the cognitive and exposure conditions.The distress model revealed aneffect of time, but noeffect for condition nor time by condition interaction. Similarly, effect sizes suggested that all three conditions evidenced moderate reductions in distress from session 1 to session 2 (range in *d’*s = 0.54 to 0.66). Between-group effect sizes comparing the conditions were negligible (*d’*s = 0.01 and 0.11).The accuracy model also revealed an effect of time, but a non-significant effect for condition and time by condition interaction. However, effect sizesrevealed a moderate effect for only CR+Expfollowing homework (*d* = 0.62), and between-group effect sizes favored CR+Expover Exp(*d* = -0.54) in reducing accuracy.Finally, the importance model found no effects for time, condition, orthe time by condition interaction.Effect sizes revealed largedecreases in importance for CD+Expafter the homework phase (*d* = 1.15), and small decreases for CR+Expand Exp(*d* = 0.21 and 0.25). 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, again 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 the course of 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 the end of 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, again 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 the end of session 1.

Next, we examined whether change in accuracy or importance from pre session 1 to session 2 predicted distress at session 2, again 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 predictingsession 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 distressassociated with negative thoughts, suggesting that whileCD+ExpandCR+Expperformed equally, neither was superior to Expalone.

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. Although the interactions between time and condition suggested trends toward differences between conditions, these did not reach statistical significance. Effect sizes revealed thatCR+Expparticipants 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+Expparticipants demonstrated large improvements in importance of negative thoughts following homework, and between-group effects indicated a benefit of CD+Exp over Expin 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. The reliance on single item outcome measures is an additional limitation. Importantly, this study examined two cognitive techniques in a brief experimentaldesign, and was not intended to test the efficacy of full ACT or CBT protocols, nor evaluate long-term outcomes of SAD.Future studies should use dismantling designs to test the impact of the cognitive techniques above and beyond exposure in standard length ACT and CBT treatment packages for anxiety.

Our results suggest that cognitive defusion, cognitive restructuring, and in-vivo exposure exercises result in similar decreases in discomfort related to socially anxious thoughtsFindings 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.

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Table 1. Descriptive Statistics and Between-Group Comparisons

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| --- | --- | --- | --- | --- | --- | --- |
| **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 Exposure 2 | 64.17 (20.32)66.09 (18.91) | 61.92 (14.51)55.77 (15.79) | 55.86 (23.31)46.71 (23.71) | \_ | \_ | \_ |
| Distress Pre Session1 Post Session 1 Post Homework | 80.75 (13.95)69.33 (14.93)73.08 (16.71) | 75.69 (19.48)65.85 (19.87)63.00 (25.97) | 82.43 (17.16)72.57 (29.80)71.14 (24.29) | 5.23\*\* | 0.62 | 0.19 |
| Accuracy Pre Session1 Post Session 1 Post Homework | 66.00 (29.94)58.17 (26.87)65.33 (34.08) | 70.08 (27.49)49.92 (28.67)53.15 (33.54) | 67.71 (39.02)67.14 (35.19)64.57 (35.20) | 4.98\* | 0.22 | 2.45± |
| Importance Pre Session1 Post Session 1 Post Homework | 84.75 (11.93)83.42 (14.27)71.08 (27.75) | 86.62 (14.47)83.15 (12.25)83.69 (12.96) | 78.57 (34.50)73.71 (30.58)69.29 (39.00) | 2.94± | 0.77 | 0.80 |

Note: Greenhouse-Geisser estimates were used to correct for violation of the sphericity assumption in the accuracy (ε=.88) and importance (ε=.73) models.

±p <.10 \*P < .05 \*\* p < .01