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The Effects Of Psychoeducation On Thought-action Fusion, Thought Suppression, Magical Thinking, And Responsibility

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THE EFFECTS OF PSYCHOEDUCATION ON THOUGHT-ACTION FUSION, THOUGHT SUPRESSION, MAGICAL THINKING, AND RESPONSIBILITY

by

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ABSTRACT

Thought-action fusion (TAF) is the phenomenon whereby one has difficulty separating cognitions, particularly those that are intrusive and disturbing, from their corresponding behaviors. Recent work has suggested that TAF is malleable and amenable to change. The current study examined the effects of three different psychoeducational interventions on thought-action fusion, anxiety, thought suppression, magical thinking, and responsibility cognitions. Assessments were conducted both immediately following the interventions and after a two-week period. Results indicated that individuals who received a cognitive-based intervention that targeted irrational thoughts had significantly lower TAF scores than individuals who received an intervention that discussed thoughts from a non-evaluative framework and individuals in the control group, both immediately following the intervention and at the two-week follow-up. As hypothesized, all groups experienced a significant decrease in anxiety between the post-intervention and follow-up assessments; however, there was a trend towards significance for those who were exposed to the cognitive-based intervention to experience a greater decrease in anxiety than those in the control group. The cognitive-based intervention group was the only group that did not experience a significant increase in thought-suppression from baseline to post-intervention, and was also the only group to experience an increase in both frequency of and belief in low-responsibility thoughts from baseline to follow-up. No significant group differences were found for the construct of magical thinking. Implications are discussed.

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INTRODUCTION

The tendency to fuse one's thoughts with overt behaviors is believed to be a cognitive bias that underlies a variety of psychopathologies, including several anxiety disorders, depression, and eating disorders (Rassin, Diepstraten, Merckelbach, & Muris, 2001; Shafran & Rachman, 2004; Berle & Starcevic, 2005; Shafran, Teachman, Kerry, & Rachman, 1999). Recent work has suggested that this bias, referred to as *thought-action fusion*, is malleable and amenable to change (Zucker et al., 2002; 2006). The purpose of this study is to examine the effects of an intervention on thought-action fusion, both immediately following the intervention and after a two-week period. A second goal of this study is to evaluate the effectiveness of the intervention at decreasing endorsements of magical thinking, thought suppression tendencies, responsibility, and anxiety, which are all constructs that have been shown to be related to thought-action fusion.

Thought-Action Fusion: An Overview

Thought-action fusion (TAF) is the phenomenon whereby one has difficulty separating cognitions, particularly those that are intrusive and disturbing, from their corresponding behaviors. Rachman (1993) first introduced this concept in the context of its occurrence in obsessive-compulsive disorder (OCD), and later concluded that TAF increases one's susceptibility for developing OCD (Rachman & Shafran, 1999). However, the growing body of literature on TAF has suggested it has implications in a wide variety of disturbances, including eating disorders, Generalized Anxiety Disorder, Social Phobia, Panic Disorder, Post-Traumatic Stress Disorder, and depression (Rassin et al., 2001; Shafran & Rachman, 2004; Berle & Starcevic, 2005; Shafran et al., 1999). TAF also has been found to be prevalent among non-

clinical populations (Zucker et al., 2002), including adolescents (Muris et al., 2001; Rassin & Koster, 2003) and children (Barrett & Healy, 2003).

The construct of TAF is thought to be comprised of two discrete components (Shafran et al, 1996). The first component, *likelihood*, refers to the belief that experiencing a particular thought increases the chance that the event will actually occur. This component can be further divided into two sub-components: *likelihood self*, which is the fear that one's thought will cause a negative event to occur to one's self, and *likelihood others,* which is the fear that one's thought will cause a negative event to occur to others. The *morality* component of TAF refers to the belief that thinking about an action is tantamount to actually performing the action. For example, a person high in TAF may render having thoughts about stabbing another person morally equivalent to doing so. This moral component is believed to be the result of the erroneous conclusion that experiencing "devious" thoughts is indicative of one's true nature and intentions.

Experiencing intrusive, disturbing, and nonsensical intrusive thoughts is extremely common and is thought to occur in 80 to 90 percent of the general population (Zucker et al., 2002). The data show that although these types of thoughts are easily dismissed by most people, persons high in TAF assign a special significance to these thoughts and subsequently obsess over them, further perpetuating the experience of TAF. There are two emerging theories in the field as to why this phenomenon occurs. The first is a cognitive model that posits those high in TAF tend to make irrational interpretations of the thoughts (Shafran et al., 1996). According to this theory, attributions of inflated responsibility or an evil nature are particularly common in those with relatively high TAF. More recent literature has examined these irrational interpretations within the context of the construct of 'magical thinking.' The second theory used to explain the

persistent nature of TAF emphasizes the role of thought suppression. When disturbed by an extremely unpleasant and intrusive thought, cognitive avoidance may occur in the form of thought suppression in order to cope (Rassin et al., 2001). However, Wegner and his colleagues (1987) suggest that this strategy is counterproductive. Wegner et al. have found that, paradoxically, attempts to suppress distressing thoughts only result in an increased frequency of intrusions, a phenomenon that has come to be known as the 'white bear effect' (due to the fact that in the study by Wegner et al., participants were instructed to suppress thoughts of white bears). This argument is strengthened by the basic behavioral principle that posits that avoidance of a feared stimulus prevents a reduction of the fear (i.e., habituation) from occurring.

Taken together, the research suggests that those high in TAF tend to engage in neutralization activity, akin to OCD compulsions, in order to negate any damage that has been inflicted by the intrusive thought. It has been hypothesized that employing this method of harm avoidance is a further extension of the tendency to fuse thoughts with real-life events (Amir et al., 2001).

TAF and Responsibility

An inflated sense of personal responsibility has long been thought to play an important role in the onset and maintenance of OCD (Salkovskis & Kirk, 1989). To operationalize the construct of dysfunctional responsibility and clarify its role in obsessional thoughts, Rachman and colleagues (1995) developed the Responsibility Appraisal Questionnaire (RAQ). The RAQ is a 36-item measure designed to assess responsibility outside of the OCD realm, in order to avoid any confounding overlap between the two constructs. In an early study by Rachman et al., undergraduate students (n = 291) completed the questionnaire and the data were subjected to a principal components analysis with varimax rotation. The results implied a four-factor solution,

suggesting the existence of four discrete components of responsibility: responsibility for harm, social responsibility, a positive attitude towards responsibility, and thought-action fusion. To confirm these findings and explore how the subscales might relate to other constructs, the RAQ was administered to a different sample of undergraduate students (n = 234) who also completed measures of obsessive-compulsive symptoms, symptoms of depression, guilt, and obsessional beliefs. The results of this second analysis corroborated the four-factor solution, suggesting that TAF is a component of exaggerated responsibility. Additionally, TAF was found to be significantly related to obsessive-compulsive symptoms, symptoms of depression, guilt, and obsessional beliefs. These correlations remained significant even after controlling for the effects of depression symptoms. TAF was the only subscale out of the four on which a significant difference in scores was obtained between those students endorsing clinical levels of OCD symptoms and the rest of the sample. Rachman et al. concluded that one's overall sense of responsibility may not be implicated in OCD, unlike TAF.

Berle and Starcevic (2005) suggest that two types of responsibility beliefs exist in individuals with obsessional thoughts. One type is the responsibility of harm prevention. Once the disturbing thought occurs, the affected individual tends to feel as if he or she is responsible for preventing the event from actually occurring. The second type of responsibility belief involves the assessment of the existence of the intrusive thoughts. Berle and Starcevic argue that attributing great significance to the fact that these thoughts are occurring creates the sense that one is morally responsible for the thoughts. They further suggest that these two types of responsibility (harm prevention and moral accountability) are related to the two components of TAF (likelihood and moral), and that the two components may occasionally be intertwined. For example, a person may feel morally responsible for having the disturbing thought of stabbing

another person and subsequently believe he or she is dishonorable and immoral. Because the person now believes he or she is a flawed and immoral individual, the person may think there is an increased likelihood of actually carrying out this act. Subsequently, the person may feel a responsibility for preventing this feared behavior.

Smári and Hólmsteinsson (2001) investigated the relationships among TAF, responsibility, intrusive thoughts, thought suppression, and obsessive-compulsive symptoms among undergraduate students (n = 211). The results indicated that responsibility attitudes and thought suppression both mediated the relationship between intrusive thoughts and obsessive-compulsive symptoms. Interestingly, the researchers also found that controlling for TAF in the mediation analyses led to strikingly similar results to those obtained when controlling for responsibility, suggesting that TAF is highly related to responsibility. This notion corroborates the aforementioned findings by Rachman et al. (1995), who examined the independent contributions of intrusive thoughts, thought suppression, and TAF to obsessive-compulsive symptoms using hierarchical regression. The results supported Rachman et al.'s hypothesis that each predictor independently influences obsessive-compulsive symptoms beyond the variance accounted by the other predictors.

TAF and Thought Suppression

Rassin, Muris, Schmidt, and Merckelbach (2000) also attempted to determine directionality in the relationship among TAF, thought suppression, and obsessive-compulsive symptoms based on a population of 173 undergraduate psychology students. Rassin et al. used a structural equation modeling approach to analyze the data. The results indicated a model in which TAF leads to attempts at thought suppression, which in turn, predicts more obsessive-compulsive symptoms. When the data were analyzed with TAF broken down into the morality

and likelihood components, the model remained intact. However, the data also suggested that it is more likely that the likelihood component directly influences obsessive-compulsive symptoms. These results support those found by Rassin, Merckelbach, Muris, and Spaan (1999), suggesting that thought-action fusion may play a causal role in the development of intrusive thoughts.

The significance of TAF and thought suppression in obsessive-compulsive disorder was examined by Rassin et al. (2001). The participants were 44 inpatients, 24 of whom met DSM-IV-TR criteria for OCD (American Psychological Association, 1994), and 20 of whom presented with other anxiety disorders. All participants completed the same set of questionnaires upon admission and discharge. The mean length of stay was 5.9 months, and treatment consisted of cognitive-behavioral interventions tailored to the specific disorder of the patient. The results revealed that endorsements of TAF, thought suppression, and obsessive-compulsive symptoms were all significantly lower at post-treatment. This finding suggests that these variables are susceptible to change. Moreover, the severity of the TAF or thought-suppression did not appear to hinder treatment efficacy. Rassin et al. also found that TAF was correlated with measures of obsessional tendencies and measures of general psychopathology in both groups of patients. Thought suppression, however, was found to be correlated with obesssional and general psychopathology in the group consisting of patients with OCD, but not in the group consisting of patients with other anxiety disorders. These results imply that the relationship between TAF and psychopathology is not specific to OCD, but occurs in other anxiety disorders as well. The relationship between thought suppression and psychopathology, on the other hand, appears to be unique to OCD.

Collectively, these results imply that thought suppression is only moderately specifically linked to OCD, and TAF appears not to be specific to OCD. These findings are consistent with finding from previous research (e.g., Purdon, 1999; Rassin et al., 2000; Shafran et al., 1999) implicating TAF and thought suppression in a wide variety of disorders. Surprisingly, no significant correlations existed between TAF and thought suppression. This is in contrast with previous findings (e.g., Rassin et al., 1999; Rachman, 1998) suggesting that TAF may be a precursor to thought suppression. Rassin et al. (2001) explain this apparent contradiction by alluding to the fact that the study participants, all of whom were inpatients with relatively high levels of psychopathology, tended to react to TAF with more overt coping strategies, such as checking and cleaning, as opposed to the more benign coping strategy of thought suppression, which may be more common among non-clinical populations.

Rassin (2001) examined the influence of TAF and thought-suppression on the development of obsession-like intrusions in a population of non-clinical participants. Forty undergraduate students were randomly assigned to either a suppression condition or a non-suppression condition, and tested individually in a laboratory setting. The participants were first asked to rate their anxiety level using a visual analogue scale. Participants were then asked to complete a task developed by Rachman, Shafran, Mitchell, Trant, and Teachman (1996) to induce TAF. The task began with participants thinking of a loved one. Next, participants were presented with a sheet of paper stating "I hope _____ is in a car accident." Participants were then asked to rewrite the sentence, substituting the name of their loved one for the blank. Finally, they were asked to ponder the situtation occuring. Next, those in the suppression condition were instructed to spend the next five minutes thinking quietly of anything that may come to mind while making sure to immediately attempt to suppress any thoughts of the

accident. The participants in the non-suppression group also were instructed to spend the next five minutes thinking quietly of anything that may come to mind and were explicitly told not to try to suppress any thoughts of the accident. After five minutes, the participants were given a brief questionnaire to complete regarding their feelings about the task and their attempts at suppression, and were then encouraged to do anything they desired that they felt might neutralize or 'cancel' out any ill effects of having written the sentence. They were then, again, asked to sit quietly for five minutes, and were told that the instructions they were given during the first five-minute period were no longer applicable. This second five-minute period was included to determine if neutralization activity led to decreased discomfort and to assess any rebound effects of thought suppression. Finally, participants were asked to complete another brief questionnaire similar to the first, as well as a measure of TAF.

Contrary to prediction, thought suppression did not predict higher anxiety scores or an increased number of intrusive thoughts. It did, however, appear to relieve some of the discomfort resulting from the TAF-like intrusion. Specifically, the results indicated that those in the suppression group spent less time thinking about the accident and rated the writing of the sentences as less morally wrong than did participants in the non-suppression group. These findings are discordant with the 'white bear effect' found by Wegner and colleagues (1987) that states that attempts at thought suppression are counterproductive insofar as they tend to result in a greater number of intrusions. Rassin (2001) attempted to reconcile this discrepancy by arguing that the paradoxical effects of thought suppression may not surpass the effects of TAF. Additionally, there was no indication of a rebound effect of thought suppression. All considered, these results seem to suggest that thought suppression may be an effective short-term coping mechanism for dealing with the anxiety induced by a TAF-like intrusion. Rassin pointed out that

even participants in the non-suppression group reported having attempted to suppress their thoughts, suggesting that TAF may inevitably induce thought suppression.

Rassin (2001) also found that neutralization activities appeared to decrease participants' anxiety and distress. Even after the participants had performed their neutralizations, they still endorsed a desire to further neutralize. Rassin surmised that this may be because the participants did not feel at liberty to engage in more dramatic forms of neutralization, such as phoning the subjects of their sentences to warn them. The results of this study also suggest that TAF is an unstable variable, as it was successfully induced by the sentence completion task. This discovery of the malleability of TAF is clinically significant because it suggests dysfunctional amounts of TAF are amenable to change.

Rassin (2001) noted that thought suppression can be viewed as a form of neutralization, insofar as it is an attempt to escape from the feared situation. The results of Rassin's study support this idea, as both thought suppression and neutralization were shown to be effective at relieving some distress. However, Rassin points out that although thought suppression and neutralization may be related, they are conceptually distinct. Thought suppression is a mere escape from the distress associated with having a thought, whereas neutralization refers at attempts to somehow undo the projected consequences of the thought.

TAF and Neutralization

Neutralization is conceptualized as an effort to somehow mitigate or nullify the distress brought on by an intrusive thought. The relationship between TAF and neutralization was first examined by Rachman, Shafran, Mitchell, Trant, and Teachman (1996). The researchers posited that neutralization is analogous to overt compulsions, albeit harder to assess or experimentally manipulate. They sought to test the hypothesis that although neutralization decreases the anxiety

induced by disturbing intrusive thoughts, if neutralization is prevented, anxiety and the urge to neutralize will decrease naturally. In their study, 63 undergraduate students with high TAF scores served as participants. After completing a questionnaire packet to assess levels of TAF, obsessive-compulsive symptoms, and symptoms of depression, the participants completed a sentence completion task designed to induce TAF, and subsequently, their anxiety levels were assessed. They were then assigned to one of two experimental conditions: immediate neutralization and delayed neutralization. In the immediate neutralization condition, participants were told they could do whatever they wanted in order to cancel out the effects of having written the sentence. All participants in this group used a physical means of neutralization, which usually consisted of altering the paper the sentence was written on in some manner. Anxiety levels were assessed immediately after neutralization and again after a twenty-minute delay during which participants were given a magazine to read. In the delayed neutralization condition, the order of these activities was reversed: participants read a magazine for twenty minutes and then were instructed to neutralize. Anxiety levels were assessed after the twenty-minute delay as well as after the neutralization. The results indicted that the use of the sentence completion task as a means of provoking anxiety was successful, as both the mean anxiety level and the mean guilt level significantly increased from baseline to post-manipulation for the entire sample. Moreover, the data revealed that both neutralization and elapsed time significantly reduced anxiety, guilt, estimates of the probability of the feared event actually happening, perceived responsibility if the event were to occur, and ratings of immorality associated with writing the sentence. The two groups significantly differed only in the urge to neutralize, which was initially higher in the delay group. However, at the final point of assessment, the two groups did not significantly differ in this regard. Rachman et al. (1996) concluded that the only

difference between a time lapse and purposeful neutralization following the intrusion of a disturbing thought was a temporary difference in the desire to neutralize. The results of their study support the idea that both anxiety and the urge to neutralize decline naturally without direct intervention.

van den Hout, van Pol, and Peters (2001) replicated the Rachman et al. (1996) study using participants who were not selected on the basis of TAF to determine if the findings would persist regardless of individual differences on the tendency to engage in TAF. Additionally, van den Hout et al. argued that in the original study by Rachman et al., the variables of interest were not assessed at the same points in time for each group. Therefore, it may have been the case that the spontaneous decay effects found in the delayed-neutralization group had already been achieved at the same point at which the suppression effects were achieved. Thus, investigating this possibility was a secondary aim of van den Hout et al.'s study. The experiment consisted of all the measures and procedures employed by Rachman et al. with two exceptions. First, the two groups of participants were divided into an experimental group that was instructed to neutralize, and a control group with no instruction. Unlike in the original study, the control group was not explicitly instructed to refrain from neutralization. Second, both groups were assessed both immediately and following a twenty-minute delay. To account for the time allotted to the immediate-neutralization group to neutralize, the "immediate" assessment of the non-neutralization group actually occurred following a two minute delay.

The results showed that all the central findings from the original study were replicated using non-TAF selected participants. Both anxiety and an urge to neutralize were evoked by the sentence completion task, engaging in neutralization techniques resulted in reduced anxiety and a diminished urge to neutralize, and the non-neutralization group also experienced reduced anxiety

after twenty minutes via natural decay. It would therefore appear that TAF is not responsible for the anxiety produced by writing the sentence or the desire to neutralize. van del Hout et al.(2001) note that this conclusion is in contrast with previous findings (e.g., Rachman & de Silva, 1978; Salkovskis & Harrison, 1984) that have found participants who were not high in TAF to not experience distress following spontaneous unpleasant intrusions. van del Hout et al. speculated that there may be a difference in reactions to private intrusions as opposed to intrusions that are made known to others, as was the case with the deliberately induced intrusion evoked by the sentence completion task. The results also showed that for both groups, anxiety and the urge to neutralize significantly decreased within two minutes. van den Hout and his colleagues stated that a possible explanation for that finding could be that those in the control group did neutralize, despite not having been instructed to do so. The findings of the Rachman et al. (1996) study seem to support this idea, as participants reported still having engaged in neutralization even after being explicitly instructed not to.

To assess whether the immediate reduction in anxiety and the urge to neutralize in the control group could be attributed to spontaneous neutralization, van den Hout, Kindt, Weiland, and Peters (2002) replicated the van den Hout et al. (2001) study with three groups of participants. As with the 2001 study, there was a group that was instructed to neutralize and a group that was given no instruction regarding neutralization. Additionally, a third group of participants was included who were prevented from neutralization by being asked to perform a cognitive task during the two minute period following the completion of the post-sentence completion assessment. The results revealed that there was no significant difference in efforts to neutralize between the group that was asked to neutralize and the group that was given no instruction. As predicted, there were significantly less endorsements of neutralization in the

group that was given the cognitive task. These results support the theory that spontaneous neutralization tends to occur following TAF, although van den Hout et al. (2002) cautioned that social desirability may have inflated suppression reports in the group that was asked to do so.

TAF and Magical Ideation

Neutralization may be viewed as an endorsement of the belief that one may be able to prevent feared events from occurring by thinking certain thoughts, or engaging in nonsensical behaviors. This way of thinking is regarded by some as a form of magical ideation, or magical thinking. Magical ideation is defined as a "belief, quasi-belief, or semi-serious entertainment of the possibility that events which, according to the causal concepts of this culture, cannot have a causal relation with each other, might somehow nevertheless do so (Meehl, 1964; cited by Eckblad & Chapman, 1983, p. 215)." Such beliefs may include a subscription to superstition, astrology, telepathy, clairvoyance, ideas of reference, or other types of paranormal activity. Magical ideation has long been considered an indicator of schizotypy, a subclinical form of schizophrenia characterized in part by superstitious beliefs, magical thinking, and fantasy proneness (Eckblad & Chapman, 1983). However, recent research has indicated that magical ideation may be involved in TAF.

Muris and Merckelbach (2003) first examined this potential link by exploring the relation between TAF and various aspects of schizotypy in two separate samples of undergraduate students. The first sample consisted of 77 participants who completed a measure of TAF, the 'magical ideation' and 'perceptual aberration' subscales of a measure of psychosis proneness, and a questionnaire assessing fantasy proneness. The second sample consisted of 64 participants who completed the measure of TAF, an assessment of schizotypal personality, a measure of disposition to hallucinate, and the questionnaire assessing fantasy proneness. Pearson product-

moment correlations revealed that, among the first sample, TAF was significantly correlated with magical ideation, perceptual aberration and fantasy proneness. However, when fantasy proneness was partialled out of the correlations, the relationships of TAF with magical ideation and perceptual aberration were no longer statistically significant. This suggests that TAF is related to fantasy proneness, but not to magical ideation or perceptual aberrations. For the second sample, TAF was found to be significantly correlated with both fantasy proneness and schizotypal traits. Additionally, there was a trend towards significance for the relationship between TAF and a disposition to hallucinate. As with the first sample, partialling fantasy proneness out of the correlations resulted in non-significant correlations between TAF and both schizotypy and disposition to hallucinate. Muris and Merckelbach concluded that the relations between TAF and various aspects of schizotypy are accounted for primarily by the correlation between TAF and fantasy proneness. They further speculated that although these constructs (TAF and schizotypal traits) share a preoccupation with unusual perceptions and ideas, they are distinctive in that TAF is a more externally directed phenomenon that often includes behavioral consequences, whereas schizotypal traits are more internal and covert. This distinction may clarify why the link between schizotypy and TAF dissipates when fantasy proneness is taken into consideration. These findings appear to support Rachman and Shafran's (1999) claim that TAF and schizotypal traits are discrete constructs.

Einstein and Menzies (2004a) examined the relation between magical thinking and TAF in a clinical population of persons meeting DSM-IV-TR (APA, 1994) diagnostic criteria for OCD. The participants completed measures of magical ideation, superstitious beliefs, superstitious behaviors, TAF, and obsessive-compulsive symptoms. The results yielded significant positive correlations between the TAF scale and the superstition and obsessive-

compulsive scales. However, when the construct of magical ideation was controlled for, these relations were no longer statistically significant. Einstein and Menzies (2004b) replicated their study with undergraduate students, and the data yielded similar results. These findings are consistent with previous research (e.g., Amir et al., 2001) that suggests that magical thinking is a core feature of obsessive-related disturbances.

Lee, Cougle, and Telch (2005) examined how the two subtypes of TAF, likelihood and morality, may be related to schizotypy traits and OCD symptoms. A sample of 968 undergraduate students completed measures of TAF, anxiety, symptoms of depression, obsessive-compulsive behaviors, and the schizotypal traits of magical thinking, unusual perceptual experience, and paranoid ideation. Using hierarchical multiple regression analyses, they found that the schizotypal traits, and magical ideation in particular, accounted for the variance found in the likelihood form of TAF beyond that which was accounted for by anxiety and depression. Moral TAF, on the other hand, was not significantly related to any of the schizotypal traits, and was only modestly linked to symptoms of depression, anxiety, and OCD. Lee et al. noted that this finding is in contrast with the findings of Abramowitz and colleagues that suggest the moral form of TAF is more directly associated with symptoms of depression and general distress (Abramowitz, Whiteside, Lynam, & Kalsy, 2003).

In a recent comprehensive analysis of TAF, Marino, Lunt, and Negy (2008) investigated the structural relationships among TAF, ethnic identity, religiosity, obsessive-compulsive symptoms, neutralization, responsibility, and magical thinking. A sample of 714 undergraduate psychology students completed self-report measures on the variables of interest, and structural equation modeling was used to examine directionality among the variables. The resulting model indicated that the extent to which individuals embraced their ethnicity (ethnic identity)

significantly predicted the extent to which they participated in religious activities, customs, and organizations (religiosity). Religiosity, in turn, was significantly predictive of a tendency to engage in TAF, a relation that was partially mediated by an inflated sense of responsibility. Stated alternately, the extent to which an individual actively participated in a religion influenced TAF both directly and indirectly via its prediction of heightened responsibility, which in turn was also predictive of TAF. Consistent with previous literature, the model also suggested that both TAF and obsessive-compulsive symptoms were significant predictors of engagement in neutralization activities. In contrast to the findings of Einstein & Menzies (2004a; 2004b), the tendency to entertain cognitions that contradict logic ("magical thinking") was not a significant factor in the model. The authors concluded that it may therefore have been the case that the previously observed impact of magical thinking on the relations between TAF and obsessive-compulsive symptoms may have been accounted for by an inflated sense of responsibility and a tendency to engage in neutralization activities.

Psychoeducational Intervention

The aforementioned study by Rassin (2001) that demonstrated TAF is amenable to change sparked an interest in therapeutic interventions for TAF. The effectiveness of a psychoeducational intervention aimed at minimizing the endorsement of TAF was first examined by Zucker, Craske, Barrios, and Holguin (2002). Undergraduates (n = 72) who scored relatively high on the Thought Action Fusion – Revised scale (Shafran et al., 1996) were randomly assigned to be in an experimental group or the control group. All participants were given measures to assess TAF and current anxiety. The experimental group heard a psychoeducational message regarding TAF that emphasized the normality and irrelevance of intrusive thoughts. Those in the control group heard a placebo message regarding stress, its consequences, and

techniques to alleviate it. After the manipulation, participants again completed the measure assessing TAF to assess for change in endorsement. Next, the participants completed a task designed to induce TAF, and subsequently rated their current levels of anxiety. The researchers found a significant interaction effect between group and point of assessment. Analyses of the simple main effects showed that TAF endorsement significantly decreased from pre-task to post-task in the experimental group, but not in the control group. For anxiety that was assessed by a visual analogue scale, there was also a significant interaction effect between group and time, suggesting that although both groups experienced an increase in anxiety from pre-task to post-task, the control group experienced a significantly higher increase in anxiety than the experimental group. An analysis of simple effects for this interaction revealed no significant differences between the two groups in anxiety at baseline, but there was a trend towards significance for the control group to have higher anxiety than the experimental group at post-task. For anxiety that was assessed by a state anxiety measure, there was no significant interaction effect between group and time. There was, however, a significant effect of time, meaning that the anxiety levels of both groups significantly increased from pre-task to post-task. Zucker et al. concluded that these results offered some support for the cognitive model of TAF proposed by Shafran et al. (1996), as they partially substantiate the notion that subjective interpretations of disturbing thoughts influence the resulting distress.

Zucker et al. sought to investigate the longer-term effects of an intervention aimed at reducing TAF (Zucker, Craske, Blackmore, & Nitz, 2006). Eighty-five participants with subclinical OCD (a classification where full criteria are not met for a disorder, but symptoms are present) were randomly assigned to one of two groups. The experimental group attended a three hour cognitive behavioral workshop consisting of psychoeducation about intrusive thoughts,

thought suppression, compulsive behaviors, and avoidance and distraction. The workshop also involved exposure and response-prevention exercises and demonstrations of cognitive restructuring. Assessments of OCD and TAF were made during initial assessment, one month after the workshop, and five months after the workshop. Those in the control group did not attend the workshop, and were assessed for OCD symptoms and TAF at the same points in time as the experimental group.

The data yielded a significant interaction effect between group and time for TAF endorsements, suggesting that TAF tended to decrease over time for those in the experimental group, but not for those in the control group. Analyses of the simple main effects revealed that the experimental group had, on average, lower TAF scores at both one-month following the workshop and five months following the workshop compared to the control group. Thus, it appears that the effects of the intervention have some longevity. Interestingly, baseline TAF was not significantly related to the severity of intrusive thoughts, although it was significantly related to frequency of intrusive thoughts. It was suggested this may indicate that TAF may increase the frequency, but not the severity, of intrusive thoughts.

Summary of Literature Review

Initially implicated only in Obsessive-Compulsive Disorder, TAF is now believed to underlie a wide variety of dysfunctional behaviors. That is, the tendency to equivocate one's internal ideas and cognitions with an associated behavioral act may be a significant component of many psychological disorders. An inflated sense of responsibility, or the belief that one is somehow accountable for events beyond one's control, is thought to contribute to the onset and maintenance of TAF. Research has also suggested that TAF often leads to neutralization as a method of coping with the distress and discomfort generated by TAF. Whereas neutralization

seems to be effective at alleviating the anxiety on a short-term basis, it is believed that neutralization ultimately increases intrusive thoughts, thereby reinforcing TAF. The research on thought suppression has been less consistent. The "White Bear Effect" theory espoused by Wegner and Zanakos (1994) posits that attempts to suppress intrusive thoughts are counterproductive insofar as they actually increase the frequency of these thoughts. Rassin (2001), however, found that participants who engaged in thought suppression experiences lower levels of anxiety than those who did not, at least in the short-term. Magical ideation, or the belief that events that cannot possibly be related are somehow causally linked, also has been implicated in TAF, and is thought to play an especially significant role in the likelihood component of TAF. Although magical ideation is typically associated with schizotypal traits, research has found that TAF and schizotypy are discrete constructs. However, recent work has suggested that the relationship between magical ideation and TAF can be accounted for by other variables, namely responsibility and neutralization. In terms of intervention, studies have suggested that TAF is a malleable construct. Previous research has demonstrated that brief psychoeducation is effective at reducing TAF and is somewhat effective at reducing the anxiety induced by TAF immediately following the intervention. The literature also suggests that workshops can reduce TAF endorsement for at least several months in a subclinical OCD population.

Cognitive Theory and TAF Intervention

Cognitive theory posits that all emotions, both pleasant and upsetting, are the results of one's subjective cognitions (Beck, 1964). Therefore, our external experiences are not what directly affect our mood, but rather the thoughts and appraisals we have regarding these experiences. Negative feelings, such as depression and anxiety, then, are the effects of

dysfunctional thinking. Applied to TAF, cognitive theory would suggest that the fusion between the intrusive thought and the action, represented by the idea that the intrusion will increase the likelihood of the event occurring or is a reflection of personal character, is the dysfunctional belief. Therefore, the intrusive thought (considered an external event insofar as it is not willingly generated by the individual) does not directly cause the anxiety (the resulting negative emotion); rather the relationship between the two is mediated by TAF (the irrational belief regarding the implication of the intrusive thought). To exemplify this, it may not be the thought of harming another person that causes the individual to experience anxiety, but the belief (i.e., fusion) that the thought may actually cause a person to be harmed that causes the individual to experience anxiety.

Grounded in cognitive theory, therapies such as cognitive therapy and cognitive-behavioral therapy aim to alleviate the distressing emotions of clients by teaching them to identify, and subsequently modify, their dysfunctional thoughts (Beck, 1995). Research has shown this type of therapy to be effective for the treatment of a wide variety of disorders. An essential component of identifying and modifying irrational beliefs is psychoeducation, during which clients are given the opportunity to learn about their disorder, and are reassured that their negative thoughts are not reflective of reality. Therefore, it may be the case that a brief psychoeducational intervention may be effective at reducing the anxiety associated with TAF, as well as the tendency to engage in TAF.

The Current Study

The purpose of this study was to examine the short-term effects of a brief intervention on thought-action fusion, magical thinking, thought suppression tendencies,

responsibility, and anxiety. This intervention was in the form of a psychoeducational message that refers to either TAF, intrusive thoughts alone, or general stress.

The current study may add to the extant literature in various ways. First, it will examine the extent to which the effects of a TAF intervention are stable in a population with high levels TAF, as opposed to a population with subclinical OCD. If effective, the results may be more generalizable to a broader range of people, as TAF has been implicated in a variety of psychological disorders other than OCD (e.g., eating disorders, depression, generalized anxiety disorder, panic disorder, social phobia, and post-traumatic stress disorder). Second, the current study may be useful in dismantling the intervention demonstrated by Zucker et al. (2006), who found that workshops three hours in length that contained a variety of psychoeducation, exposure and response prevention, and cognitive restructuring exercises, were effective at reducing TAF. In particular, the current study may help to determine if the psychoeducational portion of the workshop accounts for the decrease in TAF. However, the literature has indicated that a very brief psychoeducational message may also be effective at reducing TAF (Zucker et al., 2002). Therefore, this study aims to dismantle if the psychoeducational component accounts for the variance in TAF reduction, and if so, if the fusion portion of the psychoeducation was of particular importance. Third, no literature could be found on how such an intervention may reduce constructs that are related to TAF, including magical thinking, thought suppression, and responsibility. Because these constructs are believed to partially underlie the development and maintenance of TAF, it is crucial to examine how they might be altered by a TAF intervention. Fourth, in light of the benefits of the "new wave" cognitive therapies, such as acceptance and commitment therapy and mindfulness techniques, both of which emphasize metacognitive

awareness, the current study may be helpful in determining if these types of awareness-based therapies might be useful for those high in TAF.

Hypotheses

In light of the literature reviewed, the following hypotheses were proposed:

H1. Participants in the group exposed to the psychoeducational message on TAF will score significantly lower on measures of TAF than participants in the group exposed to the psychoeducational message on intrusive thoughts only and participants in the control group, both immediately following the intervention and at the two-week follow-up.

H2. All groups will experience decreases in anxiety from the post-intervention assessment to the two-week follow-up, due to natural decay. However, the experimental group that will be given the psychoeducation on thought-action fusion will experience significantly less anxiety than that which is accounted for by natural decay (as measured by the control group).

H3. Endorsements of thought suppression, magical thinking, and responsibility will significantly decrease from baseline assessment to post-intervention assessment in the experimental group provided with psychoeducation on thought-action fusion, but not in the experimental group provided with psychoeducation on thoughts alone or the control group. This hypothesis is based on previous research demonstrating that psychoeducation about TAF is more effective at reducing a construct related to TAF (anxiety) than a control group message.

H4. The decreases in thought suppression, magical thinking, and responsibility in the experimental group that will be given the psychoeducation on thought-action fusion will

remain significantly lower at the two-week follow-up period compared to their levels at baseline.

MATERIALS AND METHODS

Initially, 4,376 students enrolled in undergraduate psychology courses were screened for subsequent selection by completing a preliminary informed consent form and the Thought-Action Fusion Scale - Revised (Shafran et al, 1996; see below for description) online in exchange for extra credit toward their respective courses. From those students, 756 (17.28%) scored at least a 40 on the TAF-R, the score identified by recent research as being one standard deviation above the mean (Marino, Lunt, & Negy, 2008), and were invited to participate in the study. Of the 167 participants who chose to begin the protocol, 15 failed the manipulation check, and 15 (2 of whom also failed the manipulation check) did not complete the Time 2 portion. Thus, the final study sample used in data analysis was composed of 139 (25 male and 114 female) participants. Regarding ethnicity, 73 (52.5%) of the students self-identified as European American, 22 (15.8%) as Latino American, 26 (18.7%) as African American, 11 (7.9%) as Asian American, and 7 (5%) as "other." With respect to age, 121 (87.1%) of participants were between the ages of 18 and 20, 14 (10.1%) were between 21 and 25, 3 (2.2%) were between 26 and 30, and 1 (0.7%) was between the ages of 31 and 40.

Thought-Action Fusion Scale – Revised (TAF-R). The TAF-R (Shafran et al., 1996) is a 19-item measure designed to measure the extent to which individuals tend to equate their thoughts with actions (see Appendix A). In addition to providing an overall composite score, three subscale scores may also be tabulated. The overall score will be used to select participants for the study, and the overall score and the three subscales will be used in the data analyses of the study. The 'likelihood self' scale is comprised of three items designed to assess the degree to which individuals tend to believe that having a disturbing thought about themselves increases the chances of the thought actually occurring. The 'likelihood others' scale is comprised of four

items designed to assess the degree to which a person tends to believe that having a disturbing thought about others increases the chances of the thought actually occurring. The 'moral' subscale is comprised of twelve items designed to assess the belief that having a disturbing thought is the moral equivalence to actually carrying that thought out. Participants rate the extent to which they agree or disagree with each item using a five-point Likert-type scale. Individual item scores are summed to obtain an overall composite score, with higher scores reflecting a higher proclivity to engage in thought-action fusion. Likewise, individual scores within each subscale are summed to obtain the score for the subscale. These subscales have been found to have Cronbach's alphas ranging from .85 to .96. The TAF – R has been demonstrated to be a reliable instrument in a student population (Shafran et al., 1996).

Demographic questionnaire. A demographics questionnaire will be included in the questionnaire packet, on which participants will report their gender, age, ethnicity, current educational status, parents' educational attainment, and employment status (see Appendix B).

Brief Symptom Inventory. The Brief Symptom Inventory (BSI; Derogatis, 1975) is a fifty-three item measure derived from the Symptom Checklist 90 – Revised (SCL-90-R; Derogatis, 1975, 1979). The BSI is designed to screen for clinically pertinent psychological symptoms in nine symptom dimensions: obsession-compulsion, somatization interpersonal sensitivity, anxiety, depression, hostility, phobic anxiety, paranoid ideation, and psychoticism (see Appendix C). Participants respond to each item by rating how descriptive each item is of them in the current moment on a Likert-type scale. In addition to the dimension scores, a global severity index score can be obtained by summing all of the items, with higher scores being reflective of greater severity of psychopathology. The BSI will be used solely to ensure that no baseline inter-group differences exist in psychological symptomotology.

'State' subscale of the State-Trait Anxiety Inventory (STAI). The state subscale of the STAI (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) is a twenty-item measure designed to screen for symptoms of transient, situational anxiety in non-clinical populations (see Appendix D). Participants respond to each item by rating how descriptive each item is of them in the current moment on a Likert-type scale. Cronbach's alpha coefficients for the 'state' subscale of the STAI range from .92 to .94. After reversing ten items, individual item scores are summed to obtain an overall composite score, with higher scores suggesting more elevated levels of anxiety.

Responsibility Interpretations Questionnaire (RIQ). The RIQ (Salkovskis, Wroe, Gledhill, Morrison, Forrester, Richards, et al., 2000) is comprised of 22 items designed to measure the frequency of and belief in particular interpretations of intrusive thoughts about potential harm (see Appendix E). Four scores can be derived from the RIQ: frequency of high responsibility thoughts, frequency of low responsibility thoughts, belief in high responsibility thoughts, and belief in low responsibility thoughts. The Cronbach's alpha for these four subscales are .93, .86, .92, and .91, respectively. Scores for the subscales are obtained by calculating the mean for individual items of the scale. Higher scores on the two RIQ subscales that assess high responsibility are indicative of a greater sense of responsibility, and higher scores on the two RIQ subscales that assess low responsibility are indicative of a lesser sense of responsibility.

Magical Ideation Scale (MIS). The MIS (Eckblad & Chapman, 1983) is a 30-item measure designed to assess magical beliefs in myriad dimensions, including supernatural phenomena, thought action fusion, and astrology (see Appendix F). Participants respond by marking each item as true or false. The overall score is calculated by reversing seven of the

items, and summing the number of "true" responses. A higher score is indicative of a greater tendency to engage in magical thinking. The MIS has been found to have Cronbach's alphas ranging from .82 to .85, and is construct valid as a measure of schizotypy (Chapman & Chapman, 1985; Chapman, Chapman, & Miller, 1982).

White Bear Suppression Inventory (WBSI). The WBSI (Wegner & Zanakos, 1994) is a 15-item questionnaire designed to assess thought suppression. Participants respond to the items using a five-point Likert-type scale (see Appendix G). The total score is obtained by summing the items. A higher score is indicative of a stronger tendency to engage in thought suppression. The WBSI has been demonstrated to have high internal consistency and validity (Muris, Merckelbach, & Horselenberg, 1996).

Sentence Paradigm Task. The Sentence Paradigm Task (Rachman et al., 1996) is a method of inducing TAF (see Appendix H). The task begins with the researcher asking participants to think of a loved one. Participants are then given a sheet of paper stating "I hope _____ is in a car accident," and asked to rewrite the sentence, substituting the name of their loved one for the blank. The researcher then requests that the participant to close his or her eyes and briefly contemplate the situation occuring. If any participant exhibits extreme anxiety during any part of the task, or states that he or she is unable to complete the task, the experimenter will instruct the participant to think of a less serious scenario instead.

The present design is a 3 (time: baseline, post-manipulation 1, post-manipulation 2) X 3 (psychoeducation condition: Group A, Group B, Group C) between-subjects and within-subjects design. Participants were randomly assigned to one of three psychoeducation conditions, and then assessed at three separate points in time, representing an experimental design.

Individual data collection sessions occurred in a laboratory within the psychology department, and lasted approximately a half an hour in length. Each participant was provided with an informed consent form at the beginning of the session, and was asked to review the form with the researcher and sign it before the study proceeded. The researcher was present during the entire duration of the data collection to answer questions regarding the questionnaire, or general study related questions. Four participants elected to terminate the study after being asked to complete the sentence completion task, indicating that doing so would cause marked discomfort. For these individuals, the study procedures were immediately terminated and the researcher verbally assessed the nature and extent of the individual's anxiety. All four participants who chose to terminate denied experiencing an excessive amount of distress and declined counseling referrals. The researcher also verbally assessed each participant's distress level at the end of each data collection session. All participants denied experiencing an excessive amount of distress and declined counseling referrals.

Participants came into the research laboratory on two separate occasions. Each participant was randomly assigned into one of three groups: a group that received psychoeduation on thought-action fusion (Group A), a group that received psychoeducation on thoughts and cognitions (Group B), and a control group (Group C) that received psychoeducation on stress. (It should be emphasized that Group C was a control group, but not a placebo group; that is, Group C received active psychoeducation, but this information was non-cognitive in nature. Using a non-placebo control group ensures that differences between this group and the active interventions can be attributed to the content of the messages, as opposed to the mere reception of psychological information.) Participants were asked to complete the BSI and answer two questions regarding any current prescription medications and their indication. Next,

participants were asked to rate their current level of anxiety using a 14.2 cm visual analogue scale (see Appendix I), and complete the RIQ, the TAF-R, the MIS, the 'state' subscale of the STAI, and the WBSI. Next, participants in Group A received psychoeducation regarding intrusive thoughts and thought action fusion in the form of the following digitally-recorded message (taken from Zucker et al., 2002, p. 656):

It is estimated that approximately 80-90% of the population has intrusive thoughts. Intrusive thoughts are often unpleasant thoughts that come to your mind out of the blue. For example, you might be driving on a bridge and have a fleeting though about driving off the bridge, or you might have a passing thought about causing harm to a helpless person. Or, you might be in a serious relationship and have unpleasant sexual thoughts about people other than your partner. Often, when people have these bothersome thoughts they feel as though somehow, their thoughts will make the event more likely to happen. This way of thinking is wrong. Why is this way of thinking wrong? By simply thinking about a friend or family member becoming seriously ill, you will not increase the chance that they will become sick. Your thinking has no effects whatsoever on their health. Also unpleasant sexual thoughts alone do not mean you are an evil, bad or immoral person. Remember, it is completely normal to have these types of thoughts. These types of thoughts have no influence over outside events, nor are they a reflection of your character.

Participants in Group B received psychoeducation regarding intrusive thoughts in the form of the following digitally-recorded message (developed by the present author):

Most of the time, people have control over their thoughts, and can purposely choose to think about or not think about whatever they want. Sometimes, however, thoughts seem to pop into people's minds without them having intentionally brought on the thought. For example, you may be engaged in a conversation and all of a sudden an irrelevant thought will pop into your mind. These kinds of thoughts that come into your mind out of the blue are called intrusive thoughts. An intrusive thought may be pleasant to the person, or may not cause any emotion at all. At times, intrusive thoughts can also be unpleasant and upsetting. For example, you might be driving on a bridge and have a fleeting thought about driving off the bridge, or you might have a passing thought about causing harm to a helpless person. Or, you might be in a serious relationship and have unpleasant sexual thoughts about people other than your partner. Intrusive thoughts can be very scary and disturbing to the individual. These types of thoughts may cause stress and anxiety.

Participants in Group C, the control group, received psychoeducation about stress in the form of the following digitally-recorded message (taken from Zucker et al., 2002, p. 656):

There are many types of situations that cause people to experience increased levels of stress. These situations could range anywhere from driving in heavy traffic to being fired from a

job to going away to college for the first time. Maybe people around the world commonly experience some degree of stress on a regular basis. When people feel stressed they might have accompanying physical problems, such as headaches, increased muscle tension and stomachaches. It even could lead to more serious medical problems such as high blood pressure and ulcers. Many times when people experience these types of physical problems, they don't realize that they could be stress-related. Although stress cannot be fully eliminated from day-to-day life, people should try their best to minimize their amount of stress in their lives and engage in stress management techniques. Stress management can target a variety of lifestyle changes, including increasing exercise and daily activity, eating healthy and establishing regular sleeping patterns. By actively seeking to reduce and better manage stress, people are able to greatly improve the quality of their lives.

All three forms of the psychoeducational message were a similar length and recorded by the same individual. A text version of the message was provided to the participants to allow them to read along while the audiotape was playing. After listening to the message, all participants completed a manipulation check to ensure that they had attended to and understood the pre-recorded message (see Appendices J, K, and L). Next, all participants were asked to perform the Sentence Paradigm Task. After completing the Task, all participants again completed the VAS, the RIQ, the TAF-R, and the MIS. Participants were then asked to answer metacognitive questions regarding the extent to which they were impacted by the psychoeduational intervention (see Appendix M), and again complete the 'state' subscale of the STAI and the WBSI. After all measure completion had concluded, the participants were told that, if they desired, they may now do anything they want, in a mental or physical manner, to 'cancel out' the effects of the sentence. After approximately 10 seconds, participants were asked to report if they had engaged in any neutralization techniques that were not obvious to the researcher.

Two weeks after Time 1 occurred, participants returned for the Time 2 procedures. All participants were again asked to rate their current level of anxiety using the VAS, and then performed the Sentence Paradigm Task. Upon completion of the task, participants were asked to complete the VAS, RIQ, TAF-R, MIS, the 'state' subscale of the STAI, and the WSBI. All

participants were told that, if they desired, they may now do anything they want, mentally or physically, to 'cancel out' the effects of the sentence. After approximately 10 seconds, participants were asked to report if they had engaged in any neutralization techniques that were not obvious to the researcher. The participants were then debriefed and the researcher played the psychoeducational message about TAF for those who were in Groups B and C, for the possibility of therapeutic benefit.

RESULTS

Preliminary Data Analyses

To ensure between-group homogeneity at baseline, a multivariate analysis of variance (MANOVA) was conducted using group assignment as the independent variable (IV), and baseline measures of thought-action fusion (TAF-R), responsibility beliefs (RIQ), magical thinking (MIS), anxiety (as measured by the analogue rating scale and the 'state' subscale of the STAI), thought suppression tendencies (WBSI), and symptoms of psychopathology (BSI) as the dependent variables (DVs). Results revealed no significant group differences on any of the baseline measures. Means and standard deviations for all baseline measurements are presented in Table 1, and a summary of the MANOVA results is presented in Table 2.

As can be seen in Table 2, the mean baseline score on the TAF-R was 41.20, with a standard deviation of 10.12. Given the fact that individuals invited to participate in the study had a minimum score of 40 on the TAF-R at screening, these baseline data warranted an exploratory examination of the extent to which the scores were stable from screening to baseline. A paired samples T-test was conducted and revealed that, on average, TAF-R scores at baseline were significantly lower than TAF-R scores at screening ($t = 6.56$, $p < .001$). A paired samples correlation revealed a positive significant relation between TAF-R screening and baseline scores ($r = .48$, $p < .001$). Descriptive statistics revealed that 55 participants (39.57%) fell below the inclusion minimum score of 40 at the baseline assessment.

Table 1: Means and Standard Deviations of Baseline Measurements

Variable	M	SD
TAF-R[a]	41.20	10.12
STAI – State[b]	35.42	9.74
VAS[c]	2.99	2.53
WBSI[d]	50.98	11.19
MIS[e]	7.99	4.53
RIQ[f]-Frequency of High	1.11	.75
RIQ- Frequency of Low	1.80	1.05
RIQ-Belief in High	24.21	18.06
RIQ-Belief in Low	48.08	26.18
BSI[g]	88.45	22.76

Note. N = 139.

[a]TAF-R = Thought-Action Fusion Scale – Revised (Shafran et al., 1996)

[b]STAI - State = 'State' subscale of the State-Trait Anxiety Inventory (Spielberger et al., 1983)

[c]VAS = Visual Analogue Scale

[d]WBSI = White Bear Suppression Inventory (Wegner & Zanakos, 1994)

[e]MIS = Magical Ideation Scale (Eckblad & Chapman, 1983)

[f]RIQ = Responsibility Interpretations Questionnaire (Salkovskis et al., 2000)

[g]BSI = Brief Symptom Inventory (Derogatis, 1975)

Table 2: Between-Group Differences on Baseline Measurements

Variable	df	Mean Square	*F*	*p*-value
TAF-R[a]	2	117.31	1.05	.35
STAI – State[b]	2	<.001	<.001	>.999
VAS[c]	2	10.21	1.71	.19
WBSI[d]	2	51.46	.43	.65
MIS[e]	2	16.12	.81	.45
RIQ[f]-Frequency of High	2	.27	.51	.60
RIQ- Frequency of Low	2	.34	.33	.72
RIQ-Belief in High	2	6.25	.02	.98
RIQ-Belief in Low	2	22.51	.04	.96
BSI[g]	2	462.77	.90	.41

Note. N = 139.

[a]TAF-R = Thought-Action Fusion Scale – Revised (Shafran et al., 1996)

[b]STAI - State = 'State' subscale of the State-Trait Anxiety Inventory (Spielberger et al., 1983)

[c]VAS = Visual Analogue Scale

[d]WBSI = White Bear Suppression Inventory (Wegner & Zanakos, 1994)

[e]MIS = Magical Ideation Scale (Eckblad & Chapman, 1983)

[f]RIQ = Responsibility Interpretations Questionnaire (Salkovskis et al., 2000)

[g]BSI = Brief Symptom Inventory (Derogatis, 1975)

Hypothesis 1

The first hypothesis predicted that participants in the group exposed to the psychoeducational message on TAF would significantly score lower on measures of TAF than participants in the group exposed to the psychoeducational message on intrusive thoughts only and participants in the control group, both immediately following the intervention and at the two-week follow-up. To test this hypothesis, a 3 x 3 mixed model univariate analysis of variance (ANOVA; group x time) was conducted. In support of the hypothesis, the results revealed a significant interaction effect (F [4, 254]) = 4.02, $p < .01$, partial $\eta^2 = .06$). Box plots of TAF-R scores by group at baseline, post-intervention, and follow-up are depicted in Figure 1. Post-hoc pairwise comparisons revealed that, on average, individuals in the group exposed to the psychoeducational message on TAF had significantly lower scores on the TAF-R than individuals in the control group at both the post-intervention ($\Delta \bar{x} = 9.96$, $p < .01$) and at the two-week follow-up ($\Delta \bar{x} = 9.97$, $p < .01$). Additionally, there was a trend towards statistical significance for Group A having lower TAF-R scores than Group B at post-intervention ($\Delta \bar{x} = 7.19$, $p < .09$) but not at the follow-up. The TAF-R scores of Group B did not significantly differ from those of Group C at either post-intervention or follow-up. Cell means and standard deviations for the TAF-R are provided in Table 3.

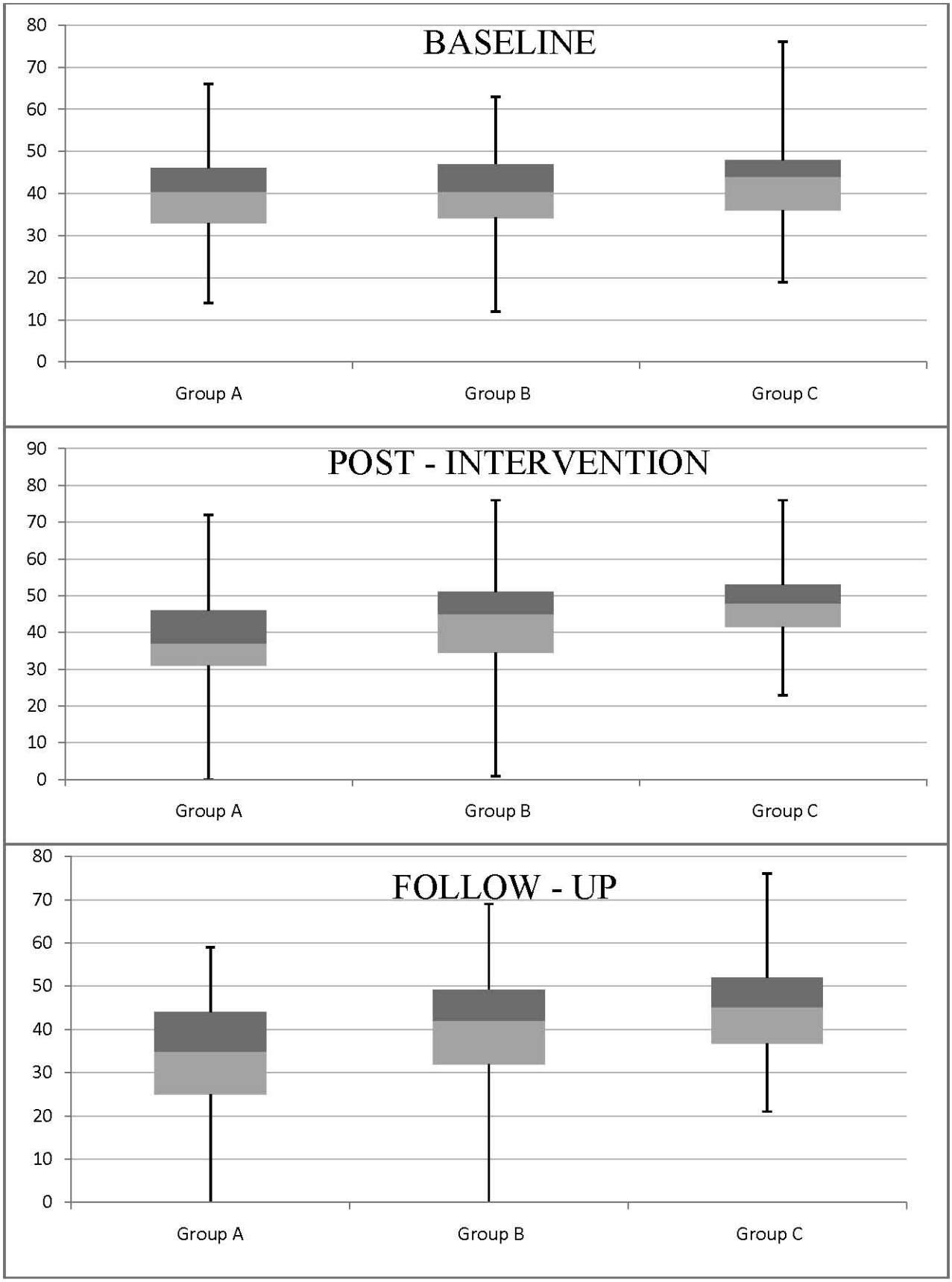

Figure 1: Box Plots of TAF-R Scores by Group across Time

Table 3: Means and Standard Deviations of TAF-R[a] Scores by Group and Time

Group	Time	M	SD
A	Baseline	40.48	11.44
	Post-intervention	37.55	16.16
	Follow-up	34.58	14.35
B	Baseline	40.33	8.80
	Post-intervention	44.74	16.30
	Follow-up	40.56	14.42
C	Baseline	42.85	9.83
	Post-intervention	47.51	11.67
	Follow-up	44.54	11.49

Note. N (listwise) = 130.

[a]TAF-R = Thought-Action Fusion Scale – Revised (Shafran et al., 1996)

Hypothesis 2

The second hypothesis was two-fold: the first prediction posited that all groups would experience decreases in anxiety from the post-intervention assessment to the two-week follow-up, due to natural decay. To test this, a 3 x 3 mixed model univariate ANOVA (group x time) was conducted for the two measures on which anxiety was assessed: the STAI and the VAS. For the STAI, there was a significant main effect of time (F [2, 254] = 52.38, $p < .001$, partial η^2 = .29). Post-hoc pairwise comparisons supported the hypothesis, demonstrating that individuals in Group A ($\Delta \bar{x}$ = 9.18, $p < .001$), Group B ($\Delta \bar{x}$ = 8.71, $p < .001$), and Group C ($\Delta \bar{x}$ = 5.91, $p <$ .01) all experienced a decrease in anxiety from post-intervention to follow-up as measured by the STAI. For anxiety measured by the VAS, there also was a significant main effect of time (F [2, 268] = 107.37, $p < .001$, partial η^2 = .45), with post-hoc comparisons again revealing that all groups experienced a decrease in anxiety from post-intervention to follow-up (Group A $\Delta \bar{x}$ = 3.21, Group B $\Delta \bar{x}$ = 2.77, Group C $\Delta \bar{x}$ = 3.03; all ps < .001).

The second part of the hypothesis predicted that individuals exposed to the psychoeducation message on thought-action fusion would experience a significantly greater reduction in anxiety than that which could be accounted for by natural decay (as measured by the control group) from post-intervention to follow-up. To test this hypothesis, difference scores were computed by subtracting individuals' STAI and VAS follow-up score from their corresponding post-intervention score. These two sets of difference scores, representing magnitude of change, were then used as the outcome variables in a one-way MANOVA with group serving as the IV. The results demonstrated that, overall, group membership did not affect the magnitude of the decrease in anxiety from post-intervention to follow-up as measured by either the STAI (F [2, 131] = .70, *ns*) or the VAS (F [2, 131] = 1.65, *ns*). Given that a priori

hypotheses justify examination of post-hoc tests, multiple comparison tests were conducted using the LSD criterion. Post-hoc analyses revealed no significant differences between group means on the magnitude scores for either the STAI or the VAS. However, there was a trend toward significance ($\Delta \bar{x} = 1.07$, $p < .08$) for Group A having a greater average magnitude of difference scores than Group C for the VAS. This finding suggests that the fact that the average decrease in anxiety from post-intervention to follow-up as measured by the VAS was greater for those in Group A as compared to Group C may be attributable to the difference in intervention assignment.

The interaction effects from the aforementioned mixed model ANOVAs on the STAI and VAS were also investigated. For anxiety as measured by the STAI, the results revealed a significant interaction effect of group and time (F [4, 254]) = 2.54, $p < .05$, partial $\eta^2 = .04$), with post-hoc pairwise comparisons no significant difference between groups A and C at either post-intervention or follow-up. For anxiety as measured by the VAS, no significant interaction effect was found (F [4, 268]) = .81, *ns*).

Hypothesis 3

The third hypothesis predicted that endorsements of thought suppression, magical thinking, and responsibility would significantly decrease from baseline assessment to post-intervention assessment in the experimental group provided with psychoeducation on thought-action fusion (Group A), but not in the experimental group provided with psychoeducation on thoughts alone (Group B) or the control group (Group C).

To examine changes in thought suppression, a 3 x 3 mixed model univariate ANOVA (group x time) was conducted using the WBSI as the DV. Due to a violation of sphericity, the Greenhouse-Geisser correction was used in the analysis (Katz, 2006). Results revealed no

significant interaction effect (F [3.56, 234.60] = .43, *ns*), although examination of post-hoc pair-wise comparisons did reveal several significant findings. For both Groups B and C, WBSI scores significantly increased from baseline to post-intervention (both ps < .05), although this was not the case for participants in Group A. Cell means and standard deviations for the WBSI are provided in Table 4.

To examine changes in magical thinking, a 3 x 3 mixed model univariate ANOVA (group x time) was conducted using the MIS as the DV. Results revealed no significant interaction effect (F [4, 252] = 1.12, *ns*), nor did the corresponding post-hoc pairwise comparisons reveal any significant differences. Cell means and standard deviations for the MIS are provided in Table 5.

To examine changes in responsibility, four separate mixed model univariate ANOVAs (group x time) were conducted using each of the four components of the RIQ (i.e., frequency of high responsibility thoughts, frequency of low responsibility thoughts, belief in high responsibility thoughts, and belief in low responsibility thoughts) as the DV. For frequency of high responsibility thoughts, results revealed no significant interaction effect (F [4, 238] = .21, *ns*), nor did the corresponding post-hoc pairwise comparisons reveal any significant differences. For frequency of low responsibility thoughts, the Greenhouse-Geisser correction was used to correct for a violation of sphericity. Results yielded a significant interaction effect (F [3.77, 248.89] = 3.07, p < .05, partial η^2 = .04), but post-hoc analyses indicated that no group experienced a significant change in frequency of low responsibility thoughts from baseline to post-intervention. Box plots of frequency of low responsibility thoughts by group at baseline, post-intervention, and follow-up are depicted in Figure 2. For belief in high responsibility thoughts, the Greenhouse-Geisser correction was used to correct for a violation of sphericity.

Results yielded no significant interaction effect (F [3.79, 221.59] = .13, *ns*), nor did the corresponding post-hoc pairwise comparisons reveal any significant differences from baseline to post-intervention. For belief in low responsibility thoughts, results revealed no significant interaction effect (F [4, 264] = .85, *ns*), nor did the corresponding post-hoc pairwise comparisons reveal any significant differences from baseline to post-intervention. Cell means and standard deviations for the all subscales of the RIQ are provided in Table 6.

Table 4: Means and Standard Deviations of WBSI[a] Scores by Group and Time

Group	Time	M	SD
A	Baseline	51.13	10.94
	Post-intervention	52.18	11.02
	Follow-up	51.93	10.79
B	Baseline	51.55	10.98
	Post-intervention	53.77	11.94
	Follow-up	53.43	11.89
C	Baseline	50.20	11.98
	Post-intervention	52.40	12.86
	Follow-up	51.06	11.65

Note. N (listwise) = 130.
[a]WBSI = White Bear Suppression Inventory (Wegner & Zanakos, 1994)

Table 5: Means and Standard Deviations of MIS[a] Scores by Group and Time

Group	Time	M	SD
A	Baseline	8.59	4.25
	Post-intervention	8.23	4.25
	Follow-up	7.69	4.11
B	Baseline	8.28	4.77
	Post-intervention	8.26	5.16
	Follow-up	7.43	5.11
C	Baseline	7.45	4.54
	Post-intervention	8.09	5.66
	Follow-up	7.48	5.18

Note. N (listwise) = 129.
[a]MIS = Magical Ideation Scale (Eckblad & Chapman, 1983)

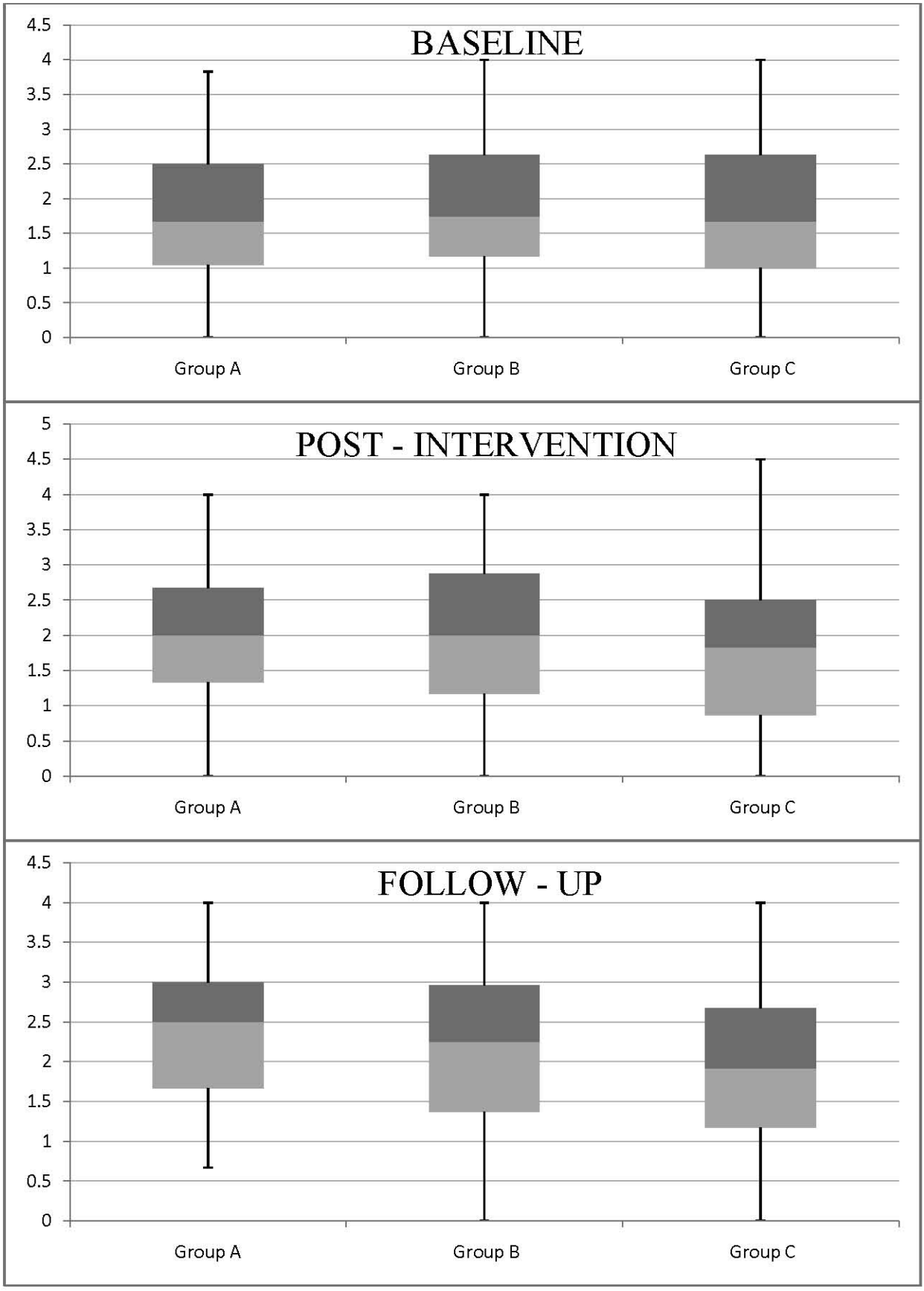

Figure 2: Box Plots of Frequency of Low Responsibility Thoughts by Group across Time

Table 6: Means and Standard Deviations of RIQ[a] Subscale Scores by Group and Time

RIQ-FH[1]	Group	Time	M	SD
	A	Baseline	1.08	.73
		Post-intervention	1.15	.92
		Follow-up	.92	.72
	B	Baseline	1.03	.74
		Post-intervention	1.11	.89
		Follow-up	.98	.85
	C	Baseline	1.11	.81
		Post-intervention	1.19	.87
		Follow-up	.95	.80
RIQ-FL[2]	Group	Time	M	SD
	A	Baseline	1.74	.93
		Post-intervention	2.00	1.12
		Follow-up	2.55	1.02
	B	Baseline	1.98	1.14
		Post-intervention	2.07	1.03
		Follow-up	2.13	1.10
	C	Baseline	1.68	1.08
		Post-intervention	1.83	1.17
		Follow-up	1.85	1.11
RIQ-BH[3]	Group	Time	M	SD
	A	Baseline	24.04	17.87
		Post-intervention	27.73	26.17
		Follow-up	19.47	19.78
	B	Baseline	23.19	17.38
		Post-intervention	27.77	24.58
		Follow-up	21.06	21.66
	C	Baseline	23.69	18.67
		Post-intervention	29.80	23.71
		Follow-up	21.64	21.38
RIQ-BL[4]	Group	Time	M	SD
	A	Baseline	49.39	25.77
		Post-intervention	54.96	31.80
		Follow-up	64.63	29.34
	B	Baseline	54.95	27.09
		Post-intervention	57.18	29.22
		Follow-up	60.43	29.39
	C	Baseline	40.83	24.61
		Post-intervention	46.02	29.47
		Follow-up	48.60	30.32

Note. N (listwise) = 122[1]; 135[2]; 120[3]; 135[4].

[a]RIQ = Responsibility Interpretations Questionnaire (Salkovskis et al., 2000)

Subscales = [1]frequency of high-responsibility thoughts; [2]frequency of low-responsibility thoughts; [3]belief in high-responsibility thoughts; [4]belief in low-responsibility thoughts

Hypothesis 4

The final hypothesis posited that the predicted decreases in thought suppression, magical thinking, and responsibility in Group A would remain significantly lower at the two-week follow-up period compared to their levels at baseline. The aforementioned post-hoc analyses from the mixed model ANOVAs on these variables were examined to test this hypothesis. The pairwise comparisons revealed no significant difference from baseline assessment to follow-up assessment on the WBSI, the MIS, the frequency of high responsibility thoughts subscale of the RIQ, or the belief in high responsibility thoughts subscale of the RIQ.

Post-hoc pairwise comparisons did reveal that for the frequency of low responsibility thoughts subscale of the RIQ, individuals in Group A experienced a significant increase from baseline to follow-up ($\Delta \bar{x} = .82$, $p < .001$), whereas individuals in Groups B and C did not. The results showed that Group A also experienced a significant increase from post-intervention to follow-up ($\Delta \bar{x} = .55$, $p < .01$), whereas individuals in Groups B and C did not.

Additionally, post-hoc pairwise comparisons revealed that, for the belief in low responsibility thoughts subscale of the RIQ, individuals in Group A experienced a significant increase from baseline to follow-up ($\Delta \bar{x} = 15.24$, $p < .01$), whereas individuals in Groups B and C did not. Cell means and standard deviations for the all subscales of the RIQ are provided in Table 6.

Exploratory Analyses

Exploratory analyses were conducted to explore any group effects on individuals' beliefs about the impact of the psychoeduational message (as assessed via the metacognitive questions), as well as potential effects of group, time, and the interaction of the two on engagement in neutralization activity (as assessed via participant report).

To investigate the extent to which intervention type affected the participants' beliefs on the impact of the intervention, Pearson χ^2 analyses were used. No significant group differences were found for responses to the first question, "Did the tape-recorded message have any influence over how you feel right now" (χ^2 [4] = 7.83, *ns*). The results revealed a significant group differences for responses to the second question, "Do you think you would feel less anxious, the same amount of anxiety, or more anxious about writing the sentence, had you not heard the tape recording?" (χ^2 [4] = 16.49, $p < .01$), with analysis of standard residual differences revealing that individuals in Group B answered "less anxious" significantly more than the other two groups ($z = 2.9$, $p < .01$). There also was a significant group difference found for responses to the third sentence, "Did you feel like you learned anything from the tape recording that relates to this particular situation?" (χ^2 [4] = 14.95, $p < .01$), with analysis of standard residual differences revealing that individuals in Group C answered "no" significantly more than the other two groups ($z = 2.1$, $p < .05$).

To investigate the extent to which intervention type affected engagement in neutralization activity, Pearson χ^2 analyses were used. No significant group differences were found for neutralization engagement at post-intervention (χ^2 [2] = .66, *ns*) or at the two-week follow-up (χ^2 [2] = .23, *ns*). Given the exploratory nature of this particular analysis, a Wilcoxon signed ranks test was conducted to investigate overall differences in neutralization between the post-intervention and follow-up assessments. The result revealed a significant difference between Time 1 and Time 2 neutralization ($Z = -2.90$, $p < .01$), with an analysis of ranks revealing that, overall, participants were more likely to engage in neutralization activities at the end of their first laboratory visit than at the two-week follow-up. A summary of all the obtained results from the hypotheses as well as exploratory analyses can be found in Table 7.

Table 7: Summary of all Results

Hypothesis	Prediction	Result
Hypothesis 1	Group A would score significantly lower on measures of TAF than participants in Groups B and C, both immediately following the intervention and at the two-week follow-up	Group A < Group C at post-intervention and follow-up; Trend towards significance for Group A < Group B at post-intervention; No differences between Groups A and B at follow-up
Hypothesis 2a	All groups will experience a decrease in anxiety from post-intervention to follow-up, due to natural decay	All groups experienced a significant decrease in anxiety from post-intervention to follow-up for both the STAI and VAS
Hypothesis 2b	Δ Group A anxiety > Δ Group C anxiety at follow up	For the VAS, there was a trend approaching significance for Group A having a greater magnitude of change than Group C; Not the case for the STAI
Hypothesis 3a	For Group A, thought suppression will significantly decrease from baseline assessment to post-intervention; this will not be the case for Groups B or C	Baseline < post-intervention for both Group B and Group C; This was not the case for Group A
Hypothesis 3b	For Group A, magical thinking will significantly decrease from baseline assessment to post-intervention; this will not be the case for Groups B or C	No significant difference between baseline and post-intervention for any of the groups
Hypothesis 3c	For Group A, responsibility thoughts will significantly decrease from baseline assessment to post-intervention; this will not be the case for Groups B or C	No significant difference between baseline and post-intervention for any of the groups for frequency or belief in high or low responsibility thoughts

Hypothesis	Prediction	Result
Hypothesis 4a	For Group A, thought suppression will significantly decrease from baseline assessment to follow-up; this will not be the case for Groups B or C	No significant difference between baseline and follow-up for any of the groups
Hypothesis 4b	For Group A, magical thinking will significantly decrease from baseline assessment to follow-up; this will not be the case for Groups B or C	No significant difference between baseline and follow-up for any of the groups
Hypothesis 4c	For Group A, responsibility thoughts will significantly decrease from baseline assessment to follow-up; this will not be the case for Groups B or C	For frequency of and belief in low responsibility thoughts, follow-up > baseline for Group A, but not for Groups B or C No significant difference between baseline and follow-up for any of the groups for frequency or belief in high responsibility thoughts
Exploratory Question 1	To what extent did intervention type affect the participants' beliefs regarding the impact of the intervention?	Group B reported that they would have felt more anxious had they not heard the message significantly more often than did Groups A or C; Group C reported that they did not learn anything relevant from the message significantly more often that did Groups A or B
Exploratory Question 2	To what extent did intervention type affect engagement in neutralization activity?	No group differences found for engagement in neutralization at post-intervention or follow-up

DISCUSSION

The purpose of this study was to investigate the effects of psychoeducational interventions on TAF, thought suppression, magical thinking, and responsibility beliefs in individuals relatively high in TAF. In line with previous work that operationalized "high" TAF as a score of one standard deviation above the mean on the TAF-R (i.e., Zucker et al., 2002), individuals were invited to participate in the study if they obtained a TAF-R score of 40 or higher during the screening phase of this study. On average, TAF-R scores significantly decreased from screening to baseline, a period of time that was fairly variable (anywhere from several days to several months). This finding was surprising given that TAF has been regarded as a fairly stable trait in the absence of intervention (Rachman & Shafran, 1999). However, given the significant correlation between the screening and baseline TAF scores, as well as the unidirectional nature of the change in scores, it would be logical to conclude that this finding does not reflect a random, expected fluctuation. Rather, there are several explanations for what might be driving this result. One reason may be due to the loss of anonymity that occurred when participants who had previously completed the TAF-R online were now completing it in the presence of an experimenter in a one-to-one setting. Research suggests that although socially desirable responding does not differ between computerized versus pencil-and-paper test administration, the extent to which the respondent is readily identifiable may impact social desirability (Booth-Kewley, Edwards, & Rosenthal, 1992). Though the screening measure used in this study was not anonymous, it would seem reasonable to suspect that the response set of social desirability may increase when answering questions in the presence of an experimenter as opposed to the more impersonal situation of being at home in front of one's computer. For example, participants may have felt less comfortable endorsing questions such as "If I think of a relative/friend being in a

car accident, this increases the risk that he/she will have a car accident" with the experimenter present due to concerns over how they might be perceived.

Another possible explanation for the difference in screening and baseline scores that relates to test administration is the contextual difference between the administrations of the measure. Although the items are the same on both forms of the measure (online and pencil-and-paper), the online version is presented on a page with 11 other unrelated questions. Given that even slight changes in the format or context of questions in self-report measures can significantly alter the outcome (Schwarz, 1999), this difference may have accounted for some of the variance in the change in scores.

A final possible explanation for the reduction in TAF-R scores from screening to baseline relates to the phenomenon of regression to the mean, whereby repeated measures from the same distribution tend to be closer to the mean on the second measurement than on the first (Galton, 1886; Bland & Altman, 1994). This trend is due to the random (or error) variance that affects the measurement of a variable. This random variance influences the extremity of scores (e.g., scores that are significantly higher or lower than the mean). Given that the effects of the random variance on a particular set of scores are independent of its effects on any prior measurements, the extent to which random variance influences a second set of scores in a repeated measures design (e.g., the baseline measurement of the TAF-R) is independent from the extent to which it affected the original set of scores (e.g, TAF-R scores at screening). Therefore, on the second measurement, the scores will appear to regress towards the population mean (Labouvie, 1982).

Nevertheless, it does not appear that the decrease in TAF-R scores from screening to baseline would impact the integrity of the results; the purpose of the inclusion criteria was to be able to examine, out of the 4,376 individuals in the screening pool, those highest in TAF.

Therefore, regardless of the extent to which the scores may or may not fluctuate from the levels captured at the screening, the objective of selecting those high in TAF with respect to their peers was met (indeed, had all participants who completed the screening questionnaire been asked to come into the lab to complete baseline measurements, the individuals selected to participate in the study may still have been at least one standard deviation above the mean). Additionally, there currently is no established clinical cut-off score that denotes "high" TAF; the criterion of one standard deviation above the mean as a cut-off was based on a previous research paradigm, and has not been empirically supported as a meaningful differentiation between "high" and "typical" endorsements of TAF. Therefore, the clinical significance of the decrease in scores is unknown. It should be noted, however, that the TAF-R means obtained by the current sample at both screening and baseline are markedly higher than the normative TAF-R means established by Shafran et al. (1996) of 29.21 for individuals with clinical levels of obsessionality and 16.82 for an undergraduate population. Due to the lack of evidence of theoretical impact of the difference between the screening and baseline TAF-R scores, no changes were made to the planned statistical analyses. However, given the absence of an established cut-off for a clinically impairing level of TAF, references to participants being "high" in TAF during the discussion of these findings should be interpreted with this ambiguity in mind.

The first hypothesis predicted that participants in Group A (i.e., participants who received the cognitive-based intervention) would score significantly lower on measures of TAF than participants in Group B (i.e., those who received the intervention discussing thoughts only) and participants in the control group, both immediately following the intervention and at the two-week follow-up. The results partially supported this hypothesis. At the assessment that occurred immediately following the intervention, individuals in Group A were less likely to endorse TAF-

related beliefs following an ego-dystonic, intrusive thought than individuals in Group B and individuals in the control group. These findings are consistent with those of Zucker et al. (2002), who discovered that individuals who received cognitive-based psychoeducation regarding TAF were less likely to endorse TAF-related beliefs following a disturbing, intrusive thought than those in a control group. In the current study, there was some evidence suggesting that the intervention targeting faulty cognitions was superior to the intervention discussing thoughts in general. Given that the power analysis was based on an effect size observed in a study using only the cognitive-based and control interventions, it may be the case that a smaller effect size exists for the effect of the thoughts-only intervention, and that a larger sample is needed to detect significant findings. If it is the case that those in Group A (i.e., participants who received the intervention that discussed the irrationality of intrusive thoughts) endorse TAF significantly less than those in Group B (e.g., participants who received the intervention that discussed thoughts in a non-evaluative manner), it would suggest that more traditional cognitive-based treatments might be more effective than "new wave" cognitive therapies that emphasize awareness, but not rational evaluation, of thoughts.

Those in Group A (i.e., individuals who received the intervention targeting the faulty cognitions underlying TAF) were also less likely to endorse TAF-related beliefs following an intrusive thought than individuals in the other two groups at the two-week follow-up. These findings suggest that the effects of this brief intervention have some degree of longevity. Although previous research has demonstrated the immediate effects of a brief intervention on TAF endorsement (Zucker et al., 2002) as well as longer-term effects of a more intensive intervention on TAF endorsement (Zucker et al., 2006), the current study is the first to establish that the effects of a brief intervention can be sustained for at least a two-week period. Moreover,

although two weeks is a relatively short period of time, these results have potential clinical significance. Given that many psychotherapy sessions occur on a weekly basis, therapeutic interventions aimed at dismantling the faulty cognitive assumptions underlying TAF may reduce TAF (and the related distress) for the intersession duration.

At the two-week follow-up, the intervention received by those in Group B (i.e., psychoeducation regarding thoughts from a non-evaluative framework) was not significantly different from either of the other two groups, which significantly differed from each other. Stated differently, although the mean TAF-R score of those in Group B was higher than that of those in Group A (i.e., the cognitive-based intervention group) and lower than that of the control group, neither of these differences were significant statistically. This pattern of group differences suggests that the longer-term effects of the Group B intervention may be somewhat greater than those of the control intervention (as evidenced by the fact that the control intervention was significantly less effective than the cognitive-based intervention of Group A, whereas the Group B intervention was not). The findings additionally suggest that the longer-term effects of the Group B intervention may be somewhat less than those of the Group A intervention (as evidenced by the fact that the cognitive-based intervention of Group A was significantly more effective than the control intervention, whereas the Group B intervention was not). Therefore, the data suggest that with respect to clinical interventions targeting TAF, cognitive-based approaches may be preferred over mindfulness-type approaches.

The first part of the second hypothesis predicted that all participants, regardless of intervention assignment, would be less anxious following the TAF-inducing task at the two-week follow-up than they were at post-intervention. The results supported this part of the hypothesis. On average, all participants endorsed less state anxiety, as measured by both the STAI-state and

the VAS, after completing the TAF-inducing task for the second time relative to Time 1. This finding is consistent with the principle of habituation which states that the anxiety elicited by a stimulus should decay over time with repeated presentations. Although in the current paradigm the stimulus of the intrusive thought was presented only twice (i.e., post-intervention and follow-up), the intrusive thought likely was attended to during the period between the laboratory visits via cognitive rumination, discussing the situation with friends, engaging in neutralization activities, and so on, given the participants' proclivity to engage in TAF. Clinically, these results offer support for an exposure-based component of treatment in individuals with TAF-related anxiety. Exposing clients to their action-fused thoughts both during session and as intersession homework may be helpful at decreasing the resulting anxiety. For example, for clients who believe an intrusive thought of a burning candle will increase the likelihood that one's house will catch on fire, intensively visualizing a burning candle during psychotherapy sessions as well as several times a day on their own may help to decrease the anxiety related to the erroneous belief over time.

The second part of the second hypothesis predicted that individuals in Group A (i.e., those who received the intervention targeting the irrational underlying beliefs of TAF) would experience a decrease in anxiety from post-intervention to follow-up that was greater than what could be accounted for by natural decay (i.e., the decrease experienced by those in the control group). Contrary to prediction, the results indicated no statistically significant between-group differences in magnitude of anxiety decrease as measured by either scale. The results did suggest a trend towards significance for those in Group A to have a greater decrease in anxiety as measured by the VAS. These results suggest that the cognitive-based intervention may have an additive effect on the decrease of TAF-related anxiety; that is, although the anxiety generated by

a particular intrusive thought will decrease on its own over time, a cognitive-based intervention may offer timelier symptom relief. The fact that this trend was found for anxiety as measured by the VAS but the not by STAI – state is consistent with the findings of Zucker et al. (2002), who found that an analogue scale was more sensitive at detecting between-group differences in anxiety than the STAI-state.

The third hypothesis predicted that endorsements of thought suppression, magical thinking, and responsibility would significantly decrease from baseline assessment to post-intervention assessment for individuals in Group A (i.e., those who received the cognitive-based intervention), but not for those in the other two groups. This hypothesis was only partially supported by the results. No significant interaction effects were found for magical thinking or responsibility beliefs, but a significant interaction was observed for thought suppression tendencies. With respect to thought suppression, an increase in endorsement was observed from baseline to post-intervention in individuals in the control group as well as those in Group B (i.e., those who were exposed to the intervention addressing thoughts in a non-evaluative manner), but not for those in Group A. In other words, although the hypothesis predicted that the cognitive-based intervention group would be the only group to experience a decrease in thought suppression, participants in that group were the only ones who did not experience an increase. It therefore may be the case that a cognitive-based intervention may not decrease thought-suppression tendencies, but may serve as a buffer against the increase in thought-suppression that occurs following an intrusive thought. Given the aforementioned paradoxical effect of thought suppression, the decrease in susceptibility to engaging in thought suppression may facilitate a decrease in the frequency of intrusive, disturbing thoughts. Stated differently, when individuals

feel less compelled to suppress the intrusive thoughts, the frequency of the thoughts may diminish.

The fourth hypothesis predicted that endorsements of thought suppression, magical thinking, and responsibility would significantly decrease from baseline assessment to the two-week follow-up assessment for those in Group A (i.e., those who received the cognitive-based intervention), but not for participants in the other two groups. The results yielded no significant change in scores from baseline to follow-up for any group on magical thinking, thought suppression, or belief in or frequency of high-responsibility thoughts. The absence of any significant deviation in scores from baseline to follow-up for thought suppression suggests that the increase in thought suppression that occurred in Group B (i.e., those who received psychoeducation regarding thoughts only) and the control group immediately following the intervention was relatively short-lived. This pattern is consistent with the habituation response; although the initial disturbing thought provokes an urge to suppress the thought, a repeated presentation elicits less of this response (again, it seems logical that additional cognitions of the intrusive thought may have occurred during the two weeks that transpired between post-intervention and follow up). Because engagement in TAF elicits thought suppression (Rassin et al., 2000), the analysis was re-conducted controlling for the effects of TAF. However, the findings were consistent even after controlling for TAF, suggesting that the intervention had a direct effect on thought suppression.

For low-responsibility thoughts (e.g., "Thinking of something happening doesn't make me responsible for whether it happens"), individuals in the Group A (i.e., those who received the intervention aimed at correcting the faulty assumptions underlying TAF) experienced a significant increase in both frequency of and belief in these thoughts, whereas individuals in the

other groups did not. Given that the message to which individuals in Group A were exposed contained many explicit low-responsibility statements (e.g., "Your thinking has no effects whatsoever on [your friend or family member's] health"), it would make sense that these individuals would tend to report an increase in the frequency of and belief in these thoughts, whereas individuals in the other groups would not. It is noteworthy that an increase in thoughts of low-responsibility was found for Group A, but not a decrease in thoughts of high-responsibility. It may be that the two types of thoughts are not mutually exclusive, and that these individuals utilized low-responsibility thoughts as a way to counteract, or neutralize, high-responsibility thoughts. It also is of interest that the increase in low-responsibility thoughts for Group A was not present at the post-intervention assessment. Given that there was no significant difference between baseline and post-intervention scores for either frequency of or belief in low-responsibility thoughts (a finding that was corroborated by the significant increase found from the post-intervention to follow-up scores for frequency of low-responsibility thoughts), it may be that the message was internalized. In other words, the effect of the cognitive-based intervention on responsibility thoughts may not have been immediate due to the fact that participants needed to internalize and contemplate the message.

The lack of findings regarding the effects of the intervention on magical thinking was somewhat surprising. Given that magical thinking tendencies have been found to correlate with TAF in previous studies, it was predicted that an intervention targeting TAF also would have an impact on magical thinking. However, the current finding is somewhat consistent with that of Marino et al. (2008) who found that the variance in the relations between magical thinking and TAF could be accounted for by the constructs of neutralization and responsibility. Therefore, it may be that the portion of magical thinking that is distinct theoretically from neutralization and

responsibility is unrelated to TAF and would therefore be unaffected by an intervention designed to target TAF.

Exploratory analyses were conducted to explore any group effects on individuals' beliefs about the impact of the psychoeduational message, as well as potential effects of group, time, and the interaction of the two on engagement in neutralization activity. No significant group differences were found for responses to the first question, "Did the tape-recorded message have any influence over how you feel right now?" which is consistent with the findings of Zucker et al. (2002). For the second question, "Do you think you would feel less anxious, the same amount of anxiety, or more anxious about writing the sentence, had you not heard the tape recording?," individuals in Group B (i.e., participants who were exposed to the thoughts-only message) answered "less anxious" significantly more than the other two groups. This finding suggests that participants in Group B, who heard the message that discussed the presence of intrusive, disturbing thoughts in a non-evaluative manner, were more likely than participants in the other two groups to believe that they were more anxious than they would have been had they not heard the message. It may be that the message was experienced as threatening insofar as it made the existence of intrusive thoughts salient, but (unlike the cognitive-based intervention received by Group A) did not dispute faulty associations between the intrusive thoughts and corresponding behaviors or morality. Though it may initially appear that this finding conflicts with theoretical underpinnings of "third wave" therapies, it is important to note that many of these therapies (e.g., mindfulness, acceptance and commitment therapy, etc.) involve explicitly instructing clients to refrain from evaluating their thoughts, whereas the message involved in this study did not (this component of explicitly directing participants not to evaluate or interpret the

intrusive thought was intentionally omitted from the psychoeducational message in order to create a bigger distinction between the two active intervention conditions).

The group differences obtained for the third sentence, "Did you feel like you learned anything from the tape recording that relates to this particular situation?," were consistent with the findings of Zucker et al. (2002), as individuals in the control group responded "no" significantly more often than individuals in the other two groups. This finding is fairly intuitive, given that the message in the control group did not contain any information relevant to the experimental paradigm, whereas the messages in the other two groups did. It is intriguing that individuals in the two active intervention conditions did not respond "yes" significantly more often than those in the control condition, however. It may be that, as observed with responsibility thoughts, participants needed time to internalize the intervention to realize the applicability to their daily experience. Additionally, the participants may not have identified the situation with which they were presented (e.g., the loved one being in a car accident) as an intrusive thought, perhaps due to the fact that it was not self-produced or spontaneous.

Analyses of neutralization responses revealed that, overall, participants were more likely to engage in neutralization activities at the end of their first laboratory visit than at the two-week follow-up. This finding is consistent with the aforementioned habituation hypothesis. Given that TAF is an antecedent to neutralization (Marino et al., 2008), it is logical to suspect that the decrease in neutralization was an artifact of the decrease in TAF. However, given that analyses controlling for the effects of TAF yielded a similar pattern of results, it appears that this was not the case.

CONCLUSION

Limitations and Future Directions

The present findings must be interpreted in the context of their limitations. First, given the absence of a clinical cut-off for TAF-R scores, the inclusion criteria of participants having TAF-R scores of at least one standard deviation above the mean lacks, to some degree, theoretical rationale. Therefore, the population to whom these results are generalizable is uncertain. Similarly, the extent to which the significant reduction in TAF-R scores from screening to baseline affects the generalizability of these results cannot be determined. Secondly, a larger sample size would elucidate whether or not some of the detected statistical trends would have reached statistical significance with added power. Although an a priori power analysis was conducted for the current study that guided the sample size, the effect size for this analysis was based on Zucker et al.'s (2002) comparison of the effects of a cognitive-based intervention and a control condition in reducing TAF. It may be that the intervention that discussed thoughts in a non-evaluative manner (i.e., the Group B intervention) also results in significantly lowered TAF, but has a much smaller effect. Likewise, the findings concerning anxiety, thought suppression, magical thinking, and responsibility also may have been more robust with a larger sample size. Finally, the current sample was comprised mainly of females, thus limiting the external validity of the findings.

Future research should expand upon the current findings in several ways. Further work is needed to discern the point at which engaging in TAF is psychologically impairing. Given that TAF falls on a normal distribution, most individuals engage in some degree of TAF, but research has yet to determine at what point on the continuum this behavior is harmful. Research aimed at establishing a clinical cut-off would be useful in determining an appropriate study population,

the results of which can be used to inform treatment. Using a measure that directly assesses the frequency and intensity of intrusive thoughts when assessing for change in TAF, such as the Revised Obsessive Intrusions Inventory (ROII; Purdon & Clark, 1993), would also be useful. Given that TAF occurs following an intrusive thought, it would valuable to know whether an intervention that lowers TAF endorsement actually reduces the likelihood that an individual engages in TAF following an intrusive thought, or if it reduces the frequency or intensity of intrusive thoughts, and TAF is thus reduced by proxy. Similarly, assessing the frequency and intensity of intrusive thoughts regarding the specific situation presented during the experimental paradigm (i.e., the car accident) would provide information regarding the temporal relations between the intervention and its efficacy on intrusive thoughts. It may be that the effect of the intervention on the intrusive thought regarding the car accident is stronger than it would be for thoughts more distal from the intervention, given that the intervention is provided immediately prior to evoking this thought. Finally, future studies should compare various TAF-reduction interventions to determine relative efficacy. Zucker et al. (2002) found that a brief psychoeducational cognitive intervention was effective at immediately decreasing TAF, and Zucker et al. (2006) found that lengthier workshop interventions containing psychoeducation, exposure and response prevention, and cognitive restructuring exercises were effective at reducing TAF immediately, and that the effects demonstrated longevity. Given that the current study demonstrates that the therapeutic effects of the brief psychoeducational cognitive intervention also have longevity, it would be useful to determine the extent to which the exposure and response prevention and cognitive restructuring exercises significantly contribute to the therapeutic effects of the psychoeducation. Thus, further research addressing these limitations and expanding upon the current findings is warranted.

APPENDIX A: TAF SCALE - REVISED

Directions: Using the scale below, please indicate the extent to which you agree or disagree with the following statements.

0	1	2	3	4
Disagree Strongly	Disagree	Neither Agree nor Disagree	Agree	Agree Strongly

1. Thinking of making an extremely critical remark to a friend is almost as unacceptable to me as actually saying it. _____
2. Having a blasphemous thought is almost as sinful to me as a blasphemous action. _____
3. Thinking about swearing at someone else is almost as unacceptable to me as actually swearing. _____
4. When I have a nasty thought about someone else, it is almost as bad as carrying out a nasty action. _____
5. Having violent thoughts is almost as unacceptable to me as violent acts. _____
6. When I think about making an obscene remark or gesture in church, it is almost as sinful as actually doing it. _____
7. If I wish harm on someone, it is almost as bad as doing harm. _____
8. If I think about making an obscene gesture to someone else, it is almost as bad as doing it. _____
9. When I think unkindly about a friend, it is almost as disloyal as doing an unkind act. _____
10. If I have a jealous thought, it is almost the same as making a jealous remark. _____
11. Thinking of cheating in a personal relationship is almost as immoral to me as actually cheating. _____
12. Having obscene thoughts in church is unacceptable to me. _____
13. If I think of a relative/friend losing their job, this increases the risk that they will lose their job. _____
14. If I think of a relative/friend being in a car accident, this increases the risk that he/she will have a car accident. _____
15. If I think of a relative/friend being injured in a fall, this increases the risk that he/she will have a fall and be injured. _____
16. If I think of a relative/friend falling ill this increases the risk that he/she will fall ill. _____
17. If I think of myself as being injured in a fall, this increases the chance that I will have a fall and be injured. _____
18. If I think of myself being in a car accident, this increases the risk that I will have a car accident. _____
19. If I think of myself falling ill, this increases the risk that I will fall ill. _____

APPENDIX B: SONA SYSTEMS DEMOGRAPHICS FORM

Listed below are questions for this section of the prescreen. Please provide a response for every question. If you are given the option to decline to answer a question, then declining to answer is considered a response.

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1. Age

- ○ Under 18
- ○ 18 - 20
- ○ 21 - 25
- ○ 26 - 30
- ○ 31 - 40
- ○ 41 - 50
- ○ Over 50

2. Gender

- ○ Male
- ○ Female

3. Race/Ethnicity

- ○ African American/Black
- ○ American Indian
- ○ Asian/Pacific Islander
- ○ Caucasian/White
- ○ Hispanic/Latino
- ○ Mixed/Other

4. Handedness

- ○ Right-handed
- ○ Left-handed

5. Year in School

- Freshman (First Year)
- Sophomore (Second Year)
- Junior (Third Year)
- Senior (Fourth Year)
- Senior + (Fifth Year or Above)

6. Are you colorblind?

- Yes
- No

7. Do you have any uncorrected visual impairment (i.e., impairment not corrected by glasses or contacts - excluding colorblindness)?

- Yes
- No

8. Do you have any uncorrected auditory/hearing impairment?

- Yes
- No

9. Is English your first language?

- Yes
- No

10. Do you have any impairment of your dominant arm or hand?

- Yes
- No

11. Are you currently employed?

- Yes
- No

12. Are you a U.S. citizen?

- Yes
- No

APPENDIX C: BSI

Below is a list of problems and complaints that people sometimes have. For each one, please indicate how much that problem has bothered or distressed you *during the past week, including today.* Please indicate whether each problem has bothered you not at all, a little bit, moderately, quite a bit, or extremely.

1. Nervousness or shakiness inside. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

2. Faintness or dizziness. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

3. The idea that someone else can control your thoughts. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

4. Feeling others are to blame for most of your troubles. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

5. Trouble remembering things. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

6. Feeling easily annoyed or irritated. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

7. Pains in heart or chest. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

8. Feeling afraid in open spaces. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

9. Thoughts of ending your life. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

10. Feeling that most people cannot be trusted. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

11. Poor appetite. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

12. Suddenly scared for no reason. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

13. Temper outbursts that you could not control. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

14. Feeling lonely even when you are with people. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

15. Feeling blocked in getting things done. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

16. Feeling lonely. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

17. Feeling blue. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

18. Feeling no interest in things. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

19. Feeling fearful. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

20. Your feelings being easily hurt. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

21. Feeling that people are unfriendly or dislike you. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

22. Feeling inferior to others. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

23. Nausea or upset stomach. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

24. Feeling that you are watched or talked about by others. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

25. Trouble falling asleep. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

26. Having to check and double check what you do. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

27. Difficulty in making decisions. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

28. Feeling afraid to travel on buses, subways, or trains. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

29. Trouble getting your breath. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

30. Hot or cold spells. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

31. Having to avoid certain things, places, or activities because they frighten you. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

32. Your mind going blank. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

33. Numbness or tingling in parts of your body. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

34. The idea that you should be punished for your sins. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

35. Feeling hopeless about the future. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

36. Trouble concentrating. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

37. Feeling weak in parts of your body. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

38. Feeling tense or keyed up. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

39. Thoughts of death or dying. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

40. Having urges to beat, injure, or harm someone. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

41. Having urges to break or smash things. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

42. Feeling very self-conscious with others. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely

1	2	3	4	5

43. Feeling uneasy in crowds. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

44. Never feeling close to another person. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

45. Spells of terror or panic. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

46. Getting into frequent arguments. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

47. Feeling nervous when you are left alone. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

48. Others not giving you proper credit for your achievements. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

49. Feeling so restless you could not sit still. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

50. Feelings of worthlessness. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

51. Feeling that people will take advantage of you if you let them. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

52. Feelings of guilt. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

53. The idea that something is wrong with your mind. (Choose one)

Not at all	A little bit	Moderately	Quite a bit	Extremely
1	2	3	4	5

APPENDIX D: STAI - State

SELF-EVALUATION QUESTIONNAIRE

Please provide the following information:

Name_____ Date_____ S_____

Age_____ Gender (*Circle*) **M** **F** T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

APPENDIX E: RIQ

We are interested in your reaction to intrusive thoughts that you have had in the last 2 weeks. Intrusive thoughts are thoughts that suddenly enter your mind, may interrupt what you are thinking or doing and tend to recur on separate occasions. They may occur in the form of words, mental images, or an impulse (a sudden urge to carry out some action). We are interested in those intrusive thoughts that are unacceptable.

Some examples of unpleasant intrusions are:

Repeated image of attacking someone
Sudden thinking that your hands are dirty and you may cause contamination
Sudden thinking that you might not have turned off the gas, or that you left a door unlocked
Repeated senseless images of harm coming to someone you love
Repeated urge to attack or harm somebody (even though you would never do this)

These are just a few examples of intrusions to give you an idea of what we are looking at; people vary tremendously in the type of thoughts that they have

IMPORTANT

Think of INTRUSIONS OF THE TYPE DESCRIBED ABOVE that you have had in the last 2 weeks, and answer the following questions with that intrusion in mind. The questions do NOT relate to all thoughts but specifically to your negative intrusions.

Please write down intrusions that you have had in the last 2 weeks:

This questionnaire has two parts:
On the next page are some ideas that may go through your **mind when you are bothered by worrying about intrusive thoughts which you know are probably senseless or unrealistic.** Think of times when you were bothered by intrusive thoughts, impulses and images **in the last 2 weeks.**

A. Frequency

Indicate how often each of the ideas listed below occurred when you were bothered by these intrusive thoughts, impulses or images; circle the digit that most accurately described the frequency of the occurrence of the ideas using the following scale:

Over the LAST TWO WEEKS:

0. Idea never occurred
1. Idea rarely occurred
2. Idea occurred during about half of the times when I had worrying intrusive thoughts
3. Idea usually occurred
4. Idea always occurred when I had worrying intrusive thoughts

FI	never occurred	rarely occurred	half the time	usually occurred	always occurred
If I don't resist these thoughts it means I am being irresponsible	0	1	2	3	4
I could be responsible for serious harm	0	1	2	3	4
I cannot take the risk of this thought coming true	0	1	2	3	4
If I don't act now then something terrible will happen and it will be my fault	0	1	2	3	4
I need to be certain something awful won't	0	1	2	3	4
I shouldn't be thinking this type of thing	0	1	2	3	4
It would be irresponsible to ignore these thoughts	0	1	2	3	4
I'll feel awful unless I do something about this thought	0	1	2	3	4
Because I've thought of bad things happening then I must act to prevent them	0	1	2	3	4
Since I've thought of this I must want it to happen	0	1	2	3	4
Now that I've thought of things which could go wrong, I have a responsibility to make sure I don't let them happen	0	1	2	3	4
Thinking this could make it happen	0	1	2	3	4
I must regain control of my thoughts	0	1	2	3	4
This could be an omen	0	1	2	3	4
It's wrong to ignore these thoughts	0	1	2	3	4
Because these thoughts come from my own mind, I must want to have them	0	1	2	3	4
Now rate these items:					
Thoughts can NOT make things happen	0	1	2	3	4
This is just a thought so it doesn't matter	0	1	2	3	4
Thinking of something happening doesn't make me responsible for whether it happens	0	1	2	3	4
There's nothing wrong with letting such thoughts come and go Naturally	0	1	2	3	4
Everybody has horrible thoughts sometimes, so I don't need to worry about this one	0	1	2	3	4
Having this thought doesn't mean I have to do anything about it	0	1	2	3	4

B. Belief

Over the last two weeks. When you were bothered by these worrying intrusive thoughts, how much did you believe each of these ideas to be true? Rate the belief you had of these ideas when you had the intrusions, using the following scale; mark the point on the line that most accurately applies to your belief at the time of the intrusion.

B1	I did not believe this idea at all										I was completely convinced this idea was true
If I don't resist these thoughts it means I am being irresponsible	0	10	20	30	40	50	60	70	80	90	100
I could be responsible for serious harm	0	10	20	30	40	50	60	70	80	90	100
I cannot take the risk of this thought coming true	0	10	20	30	40	50	60	70	80	90	100
If I don't act now then something terrible will happen and it will be my fault	0	10	20	30	40	50	60	70	80	90	100
I need to be certain something awful won't	0	10	20	30	40	50	60	70	80	90	100
I shouldn't be thinking this type of thing	0	10	20	30	40	50	60	70	80	90	100
It would be irresponsible to ignore these thoughts	0	10	20	30	40	50	60	70	80	90	100
I'll feel awful unless I do something about this thought	0	10	20	30	40	50	60	70	80	90	100
Because I've thought of bad things happening then I must act to prevent them	0	10	20	30	40	50	60	70	80	90	100
Since I've thought of this I must want it to happen	0	10	20	30	40	50	60	70	80	90	100
Now that I've thought of things which could go wrong, I have a responsibility to make sure I don't let them happen	0	10	20	30	40	50	60	70	80	90	100
Thinking this could make it happen	0	10	20	30	40	50	60	70	80	90	100
I must regain control of my thoughts	0	10	20	30	40	50	60	70	80	90	100
This could be an omen	0	10	20	30	40	50	60	70	80	90	100
It's wrong to ignore these thoughts	0	10	20	30	40	50	60	70	80	90	100
Because these thoughts come from my own mind, I must want to have them	0	10	20	30	40	50	60	70	80	90	100

Now rate these items: B2	I did not believe this idea at all										I was completely convinced this idea was true
Thoughts can NOT make things happen	0	10	20	30	40	50	60	70	80	90	100
This is just a thought so it doesn't matter	0	10	20	30	40	50	60	70	80	90	100
Thinking of something happening doesn't make me responsible for whether it happens	0	10	20	30	40	50	60	70	80	90	100
There's nothing wrong with letting such thoughts come and go Naturally	0	10	20	30	40	50	60	70	80	90	100
Everybody has horrible thoughts sometimes, so I don't need to worry about this one	0	10	20	30	40	50	60	70	80	90	100
Having this thought doesn't mean I have to do anything about it	0	10	20	30	40	50	60	70	80	90	100

APPENDIX F: MIS

Directions: For each item, please circle whether it is True or False for you.

1. I have occasionally had the silly feeling that a TV or radio broadcaster knew I was listening to him. T F

2. I have felt that there were messages for me in the way things were arranged, like in a store window. T F

3. Things sometimes seem to be in different places when I get home, even though no one has been there. T F

4. I have never doubted that my dreams are the products of my own mind.
T F

5. I have noticed sounds on my CDs that are not there at other times.
T F

6. I have had the momentary feeling that someone's place has been taken by a look-alike.
T F

7. I have never had the feeling that certain thoughts of mine really belonged to someone else.
T F

8. I have wondered whether the spirits of the dead can influence the living.
T F

9. At times I perform certain little rituals to ward off negative influences.
T F

10. I have felt that I might cause something to happen just by thinking too much about it.
T F

11. At times, I have felt that a professor's lecture was meant especially for me.
T F

12. I have sometimes felt that strangers were reading my mind.
T F

13. If reincarnation were true, it would explain some unusual experiences I have had.
T F

14. I sometimes have a feeling of gaining or losing energy when certain people look at me or touch me. T F

15. It is not possible to harm others merely by thinking bad thoughts about them.
T F

16. I have sometimes sensed an evil presence around me, although I could not see it.
T F

17. People often behave so strangely that one wonders if they are part of an experiment.
T F

18. The government refuses to tell us the truth about UFOs.
T F

19. I almost never dream about things before they happen.
T F

20. I have sometimes had the passing thought that strangers are in love with me.
T F

21. The hand motions that strangers make seem to influence me at times.
T F

22. Good luck charms don't work. T F

23. I have sometimes been fearful of stepping on sidewalk cracks.
T F

24. Numbers like 13 and 7 have no special powers.
T F

25. I have had the momentary feeling that I might not be human.
T F

26. I think I could learn to read others' minds if I wanted to.
T F

27. Horoscopes are right too often for it to be a coincidence.
T F

28. Some people can make me aware of them just by thinking about me.
T F

29. I have worried that people on other planets may be influencing what happens on Earth.
T F

30. When introduced to strangers, I rarely wonder whether I have known them before.
T F

APPENDIX G: WBSI

Directions: Using the scale below, please indicate the extent to which you agree or disagree with the following statements.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

1. There are things I prefer not to think about. _____
2. Sometimes I wonder why I have the thoughts I do. _____
3. I have thoughts that I cannot stop. _____
4. There are images that come to mind that I cannot erase. _____
5. My thoughts frequently return to one idea. _____
6. I wish I could stop thinking of certain things. _____
7. Sometimes my mind races so fast I wish I could stop it. _____
8. I always try to put problems out of mind. _____
9. There are thoughts that keep jumping into my head. _____
10. Sometimes I stay busy just to keep thoughts from intruding on my mind. _____
11. There are things that I try not to think about. _____
12. Sometimes I really wish I could stop thinking. _____
13. I often do things to distract myself from my thoughts. _____
14. I have thoughts that I try to avoid. _____
15. There are many thoughts that I have that I don't tell anyone. _____

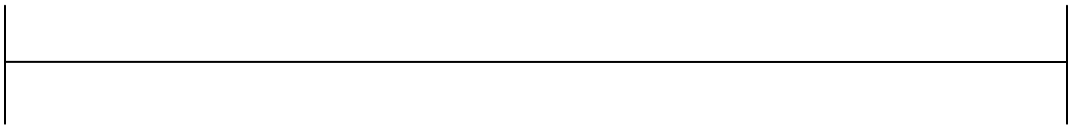
APPENDIX H: SENTENCE PARADIGM TASK

I hope _____ is in a car accident.

_____

APPENDIX I: VISUAL ANALOGUE SCALE

How anxious do you feel right now?



Not at
all anxious

So anxious that
it's unbearable

APPENDIX J: MANIPULATION CHECK – GROUP A

MCTF

1. It is very common to have unpleasant thoughts come into your mind out of the blue.

TRUE or FALSE

2. These types of thoughts are a reflection of your character.

TRUE or FALSE

3. These types of thoughts have no influence over outside events.

TRUE or FALSE

APPENDIX K: MANIPULATION CHECK – GROUP B

MCT

1. Sometimes people have thoughts that come into their mind out of the blue.

TRUE or FALSE

2. These unintentional thoughts are always pleasant.

TRUE or FALSE

3. Intrusive thoughts may cause stress and anxiety.

TRUE or FALSE

APPENDIX L: MANIPULATION CHECK – GROUP C

MCC

1. Maybe people around the world commonly experience some degree of stress on a regular basis.

   TRUE or FALSE

2. Physical problems cannot be related to stress.

   TRUE or FALSE

3. By actively seeking to reduce and better manage stress, people are able to greatly improve the quality of their lives.

   TRUE or FALSE

APPENDIX M: QUESTIONS ABOUT THE SENTENCE PARADIGM TASK

1. Did the tape-recorded message have any influence over how you feel right now?

YES / NO / DON'T KNOW

2. Do you think you would feel less anxious, the same amount of anxiety, or more anxious about writing the sentence, had you not heard the tape recording?

LESS / SAME / MORE

3. Did you feel like you learned anything from the tape recording that relates to this particular situation?

YES / NO / DON'T KNOW

APPENDIX N: IRB APPROVAL LETTER

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Notice of Expedited Initial Review and Approval

From : **UCF Institutional Review Board**
FWA00000351, Exp. 5/07/10, IRB00001138

To : **Teresa Marino**

Date : **July 27, 2007**

IRB Number: **SBE-07-05084**

Study Title: **The Effects of Psychoeducation on Thought-Action Fusion, Thought Suppression, Magical Thinking, and Responsibility**

Dear Researcher:

Your research protocol noted above was approved by **expedited** review by the UCF IRB Chair on 7/25/2007. **The expiration date is 7/24/2008.** Your study was determined to be minimal risk for human subjects and expeditable per federal regulations, 45 CFR 46.110. The category for which this study qualifies as expeditable research is as follows:

> 7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The IRB has approved a **consent procedure which requires participants to sign consent forms.** Use of the approved, stamped consent document(s) is required. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Subjects or their representatives must receive a copy of the consent form(s).

All data, which may include signed consent form documents, must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

To continue this research beyond the expiration date, a Continuing Review Form must be submitted 2 – 4 weeks prior to the expiration date. Advise the IRB if you receive a subpoena for the release of this information, or if a breach of confidentiality occurs. Also report any unanticipated problems or serious adverse events (within 5 working days). Do not make changes to the protocol methodology or consent form before obtaining IRB approval. Changes can be submitted for IRB review using the Addendum/Modification Request Form. An Addendum/Modification Request Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at http://iris.research.ucf.edu .

Failure to provide a continuing review report could lead to study suspension, a loss of funding and/or publication possibilities, or reporting of noncompliance to sponsors or funding agencies. The IRB maintains the authority under 45 CFR 46.110(e) to observe or have a third party observe the consent process and the research.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Janice Turchin on 07/27/2007 10:13:56 AM EDT

IRB Coordinator

REFERENCES

Abramowitz, J., Whiteside, S., Lynam, D., & Kalsy, S. (2003). Is thought-action fusion specific to obsessive-compulsive disorder? A mediating role of negative affect. *Behaviour Research and Therapy, 41*, 1069-1079.

Amir, N., Freshman, M., Ramsey, B., Neary, E., & Brigidi, B. (2001). Thought-action fusion in individuals with OCD symptoms. *Behaviour Research and Therapy, 39*, 765-776.

Barrett, P., & Healy, L. (2003). An examination of the cognitive processes involved in childhood obsessive-compulsive disorder. *Behaviour Research and Therapy, 41*, 285-299.

Beck, A. T. (1964). Thinking and depression: II. Theory and therapy. *Archives of General Psychiatry, 10*, 561-571.

Beck, J. S. (1995). *Cognitive Therapy: The Basics and Beyond*. New York: The Guilford Press.

Berle, D., & Starcevic, V. (2005). Thought-action fusion: review of the literature and future directions. *Clinical Psychology Review, 25*, 263-284.

Bland, J., & Altman, D. (1994). Statistics notes: Regression towards the mean. *British Medical Journal, 308*, 1499.

Booth-Kewley, S., Edwards, J., & Rosenthal, P. (1992). Impression management, social desirability, and computer administration of attitude questionnaires: Does the computer make a difference? *Journal of Applied Psychology, 77*, 562-566.

Chapman, L., & Chapman, J. (1985). *Controversies in schizophrenia: Changes and constancies.* Paper presented at the 74th Annual Meeting of the American

Psychopathological Association, New York City.

Chapman, L., Chapman, J., & Miller, E. (1982). Reliabilities and intercorrelations of eight measures of proneness to psychosis. *Journal of Consulting and Clinical Psychology, 50*(2), 187-195.

Derogatis, L. (1975). *Brief Symptom Inventory*. Baltimore: Clinical Psychometric Research.

Derogatis, L. (1975). *The SCL-R-90.* Baltimore: Clinical Psychometric Research.

Derogatis, L. (1977). *The SCL-R-90 Manual I: Scoring, Administration, and Procedures for the SCL-90*. Baltimore: Clinical Psychometric Research.

Eckblad, M., & Chapman, L. (1983). Magical ideation as an indicator of schizotypy. *Journal of Consulting and Clinical Psychology, 51*(2), 215-225.

Einstein, D., & Menzies, R. (2004a). The presence of magical thinking in obsessive compulsive disorder. *Behaviour Research and Therapy, 42*, 539-549.

Einstein, D., & Menzies, R. (2004b). Role of magical thinking in obsessive-compulsive symptoms in an undergraduate sample. *Depression and Anxiety, 19*, 174-179.

Galton, F. (1886). Regression toward mediocrity in hereditary stature. *Journal of the Anthropological Institute*, 15, 246-263.

Katz, M. (2006). *Multivariable Analysis: A Practical Guide for Clinicians.* New York: Cambridge University Press.

Labouvie, E. (1982). The concept of change and regression toward the mean. *Psychological Bulletin, 92*, 251-257.

Lee, H., Cougle, J., & Telch, M. (2005). Thought-action fusion and its relationship to schizotypy and OCD symptoms. *Behaviour Research and Therapy, 43*, 29-41.

Marino, T., Lunt, R., & Negy, C. (2008). Thought-action fusion: A comprehensive analysis using structural equation modeling. *Behaviour Research and Therapy,* 46, 845-853.

Muris, P., & Merckelbach, H. (2003). Thought-action fusion and schizotypy in undergraduate students. *British Journal of Clinical Psychology, 42*, 211-216.

Muris, P., Meesters, C., Rassin, E., Merckelbach, H., & Campbell, J. (2001). Thought-action fusion and anxiety disorders symptoms in normal adolescents. *Behaviour Research and Therapy, 39*, 843-852.

Purdon, C. (1999). Thought suppression and psychopathology. *Behaviour Research and Therapy, 37*(11), 1029-1054.

Purdon, C., & Clark, D. A. (1993). Obsessive intrusive thoughts in nonclinical subjects: I. Content and relation with depressive, anxious and obsessional symptoms. *Behaviour Research and Therapy*, 3*1*, 713-720.

Rachman, S., & Shafran, R. (1999). Cognitive distortions: Thought-action fusion. *Clinical Psychology and Psychotherapy, 6*, 80-85.

Rachman, S. (1998). A cognitive theory of obsessions: Elaborations. *Behaviour Research and Therapy, 36*(4), 385-401.

Rachman, S., Shafran, R., Mitchell, D., Trant, J., & Teachman, B. (1996). How to remain neutral: an experimental analysis of neutralization. *Behaviour Research and Therapy, 34*(11/12), 889-898.

Rachman, S., Thordarson, D., Shafran, R., & Woody, S. (1995). Perceived responsibility: Structure and significance. *Behaviour Research and Therapy, 33*(7), 779-784.

Rachman, S. (1993). Obsessions, responsibility, and guilt. *Behaviour Research and*

Therapy, 31(2), 149-154.

Rachman, S., & de Silva, P. (1978). Abnormal and normal obsessions. *Behaviour Research and Therapy, 16*, 233-248.

Rassin, E., & Koster, E. (2003). The correlation between thought-action fusion and religiousity in a normal sample. *Behaviour Research and Therapy, 41*, 361-368.

Rassin, E. (2001). The contribution of thought-action fusion and thought supression in the development of obsession-like intrusions in normal participants. *Behaviour Research and Therapy, 39*, 1023-1032.

Rassin, E., Diepstraten, P., Merckelbach, H., & Muris, P. (2001). Thought-action fusion and thought supression in obsessive-compulsive disorder. *Behaviour Research and Therapy, 39*, 757-764.

Rassin, E., Muris, P., Schmidt, H., & Merckelbach, H. (2000). Relationships between thought-action fusion, thought suppression and obsessive-compulsive symptoms: a structural equation modeling approach. *Behaviour Research and Therapy, 38*, 889-897.

Rassin, E., Merckelbach, H., Muris, P., & Spaan, V. (1999). Thought-action fusion as a causal factor in the development of intrusions. *Behaviour Research and Therapy, 37*, 231-237.

Salkovskis, P., Wroe, A., Gledhill, A., Morrison, N., Forrester, E., Richards, C., et al. (2000). Responsibility attitudes and interpretations are characteristic of obsessive compulsive disorder. *Behaviour Research and Therapy, 38* , 347-372.

Salkovskis, P., & Kirk, J. (1989). Obsessional disorders. In K. Hawton, P. Salkovskis, J. Kirk & D. Clark (Eds.), *Cognitive Behaviour Therapy for Psychiatric Problems: A Practical Guide.* New York: Oxford University Press.

Salkovskis, P., & Harrison, J. (1984). Abnormal and normal obsessions: A replication. *Behaviour Research and Therapy, 22*(5), 549-552.

Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist, 54*, 93-105.

Shafran, R., & Rachman, S. (2004). Thought-action fusion: a review. *Journal of Behavior Therapy and Experimental Psychiatry, 35*, 87-107.

Shafran, R., Teachman, B., Kerry, S., & Rachman, S. (1999). A cognitive distortion associated with eating disorders: Thought-shape fusion. *British Journal of Clinical Psychology, 38*, 167-179.

Shafran, R., Thordarson, D., & Rachman, S. (1996). Thought-action fusion in obsessive compulsive disorder. *Journal of Anxiety Disorders, 10*(5), 379-391.

Smári, J., & Hólmsteinsson, H. (2001). Intrusive thoughts, responsibility attitudes, thought-action fusion, and chronic thought suppression in relation to obsessive-compulsive symptoms. *Behavioural and Cognitive Psychotherapy, 29*, 13-20.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual of the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.

van den Hout, M., Kindt, M., Weiland, T., & Peters, M. (2002). Instructed neutralization, spontaneous neutralization and prevented neutralization after an obsession-like thought. *Journal of Behavior Therapy and Experimental Psychiatry, 33*, 177-189.

van den Hout, M., van Pol, M., & Peters, M. (2001). On becoming neutral: effects of experimental neutralizing reconsidered. *Behaviour Research and Therapy, 39*, 1439-1448.

Wegner, D., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality and Social Psychology, 62*(4), 615-640.

Wegner, D., Schneider, D., Carter, S., & White, T. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53*(1), 5-13.

Zucker, B., Craske, M., Blackmore, M., & Nitz, A. (2006). A cognitive behavioral workshop for subclinical obsessions and compulsions. *Behaviour Research and Therapy, 44*(2), 289-304.

Zucker, B., Craske, M., Barrios, V., & Holguin, M. (2002). Thought action fusion: can it be corrected? *Behaviour Research and Therapy, 40*, 653-664.