ACCEPTANCE AND THOUGHT SUPPRESSION AS MECHANISMS OF
CHILDHOOD OBSESSIVE-COMPULSIVE DISORDER (OCD)

by

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This preliminary study experimentally examined the effects of two emotion regulation conditions (Thought Suppression and Acceptance) for intrusive thoughts on thought count frequency, subjective thought frequency, distress, and secondary outcome variables deemed important to youth intrusive thoughts in a heterogeneous clinical sample of 24 youth participants over three study time periods (baseline, experimental, return to baseline). A series of two-way, repeated ANOVAs revealed that there were no statistically significant differences between Thought Suppression and Acceptance from baseline to the experimental period or from the experimental to the return to baseline period in thought count frequency, subjective thought frequency, and distress, suggesting no counterproductive effects of youth thought suppression compared to acceptance. A series of one-way ANCOVAs revealed that there were no between-condition statistically significant differences in the levels of believability, urge to push away target thoughts, and willingness to continue thinking about target thoughts in the experimental or return to
baseline periods. But, according to nonsignificant trends based on effect sizes, there was a medium to large effect size for greater decreases in distress from baseline to the experimental period in Acceptance than Thought Suppression, a large effect size for greater decreases in subjective thought frequency from the experimental to return to baseline period in Acceptance than Thought Suppression, and a large effect size for lower urges to push away target thoughts during the return to baseline period in Acceptance than Thought Suppression. If trends continue with larger samples, they could indicate a possible counterproductive effect of thought suppression and beneficial comparative impact of acceptance strategies in clinical youth. Study innovations, limitations, and recommendations for future paradigms with clinical youth are discussed.
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Acceptance and Thought Suppression as Mechanisms of Childhood

Obsessive-Compulsive Disorder (OCD)

Obsessive-compulsive disorder is a debilitating and chronic disorder that afflicts many children and adolescents, with prevalence rates estimated at between 1 and 4% of youth (Heyman et al., 2003). Children with OCD suffer significant interference across multiple domains of normal childhood functioning due to the core symptoms of obsessions and compulsions (Piacentini, Bergman, Keller, & McCracken, 2003). Obsessions are intrusive, repetitive thoughts, images or impulses that are associated with significant negative affect, (e.g., typically anxiety; American Psychiatric Association (APA), 2000). Compulsions are purposeful, repetitive behaviors or rituals performed in an effort to relieve distress associated with the obsessions (APA, 2000).

Cognitive behavioral therapy (CBT) has shown success in treating childhood OCD (Pediatric OCD Treatment Study (POTS) Team, 2004; Valderhaug, Larsson, Gotestam, & Piacentini, 2007). The expert consensus guidelines have recommended CBT to be the first line-treatment for pre-pubertal children with OCD, and CBT with or without medication to be the first-line treatment for adolescents (March, Frances, Carpenter, & Kahn, 1997). Across studies of CBT for childhood OCD, mean reductions in OCD severity ratings have ranged from 45-65%, and mean childhood OCD remission rates have ranged from 40-88% (Turner, 2006).

However, even though these results are positive, 12-60% of children and adolescents are still left with clinically significant OCD at the end of treatment. The substantial proportion of children who have not remitted suggests a need to enhance the treatment.
Further research in underlying mechanisms of childhood disorders like OCD can help identify additional targets to improve treatment (Chu & Harrison, 2007). Thought suppression and acceptance have been identified as promising basic processes in OCD (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Salvoskis, 1996), but have been rarely assessed in child populations. The current study proposes to experimentally examine the effects of thought suppression and acceptance on thoughts and distress in children with OCD.

Thought Suppression as a Mechanism in OCD

Thought suppression is an individual’s attempts to avoid, suppress, or get rid of unwanted thoughts, and has been closely associated with OCD (Hannan & Tolin, 2005). Individuals with OCD have been found to engage in thought suppression to reduce or prevent the distress caused by their obsessions (Freeston & Ladouceur, 1997), and have been found to use it more than non-anxious controls (Abramowitz, Whiteside, Kalsy, & Tolin, 2003). In fact, it has been so closely associated with OCD that it is included in the diagnostic criteria for obsessions in OCD in the Diagnostic and Statistical Manual for Mental Disorders, fourth edition (DSM-IV, APA, 2000).

Cognitive behavioral (CB) theory suggests that individuals with OCD make negative appraisals about their thoughts (e.g., “The presence of a thought means that it is important,” and “Having a thought about an unwanted event will increase the likelihood that the event will occur”), triggering anxiety and the use of thought suppression (Obsessive Compulsive Cognitions Working Group (OCCWG), 1997; Salvoskis, 1996). Although thought suppression attempts aim to limit the frequency of intrusive thoughts, CB theories suggest that thought suppression paradoxically leads to an increase rather
than decrease in frequency of unwanted thoughts (Salvoskis, 1996; Wegner, 1992). In this way, thought suppression may actually serve to maintain thought intrusions and anxiety in OCD.

*The effects of thought suppression on thought frequency*

According to one prominent theory, ironic processing theory (Wegner, Erber, & Zanakos, 1994), the paradoxical effects of thought suppression on thought frequency result from the interplay of two cognitive processes. The first intentional process is the conscious search for distracting thoughts unrelated to the unwanted thought. The second simultaneous monitoring process is an unconscious and less effortful search for the unwanted thought, which if found, signals the individual to renew the distracter search. Because the second monitoring process searches for the unwanted thought, it ironically increases the accessibility of the unwanted thought to consciousness. So, the act of suppressing paradoxically increases the probability that the unwanted thought enters the conscious mind during suppression. The immediate increase in thought frequency during suppression is referred to as the *immediate enhancement effect* (Wegner, Schneider, Carter, & White, 1987).

When suppression stops, the intentional process no longer produces distracting thoughts, but the less effortful search for the unwanted thought still scans for the unwanted thought and brings it to mind (Wegner et al., 1994). The subsequent increase in thought frequency after suppression has ended is referred to as the *rebound effect* (Wegner et al., 1987). In sum, according to ironic processing theory, suppressing a thought ironically produces increases in thought frequency both during and after suppression.
Various studies have demonstrated immediate enhancement and rebound effects of thought suppression on thought frequency (Marcks & Woods, 2005; Wegner et al., 1987). In a seminal study of thought suppression, Wegner et al. (1987) demonstrated that thought suppression had limited effectiveness in the acute phase and produced a paradoxical rebound effect in the subsequent phase. Thirty-four undergraduates participated in one of two experimental conditions: initial expression or initial suppression. Participants in these two conditions performed the same tasks but in the opposite order. Participants in the initial expression condition first completed the expression task and then the suppression task, while participants in the initial suppression condition first completed the suppression task and then the expression task. During both tasks, participants in both conditions spent five-minutes reporting to a tape recorder everything that came to mind. In the suppression task, participants were told to verbalize all thoughts and to not think of a white bear, but to ring the bell when they thought of a white bear. In the expression task, students were given the same instructions except they were told to try to think of a white bear.

The results showed that the suppression condition did not result in complete suppression of thoughts and was, in fact, counterproductive. Even though participants were instructed to suppress, thoughts about a white bear occurred more than once per minute in the suppression task. Furthermore, initial suppression produced a surge in frequency of thoughts about white bears during the following expression period. There were no such increases in white bear thoughts for the other condition, in which the suppression period followed the expression condition. Overall, these findings suggest that suppression is not exceptionally effective in immediately reducing unwanted thoughts.
and may result in paradoxical, subsequent increases in their frequency (i.e., a rebound effect).

Clark, Ball, and Pape (1991) replicated the rebound effect in an experimental study in which participants listened to a taped story about a green rabbit. This was followed by two two-minute time periods during which the experimenter tape-recorded participants reporting their thoughts. For the first time period, participants were told one of three sets of instructions: to not think about the story, to think about anything, or to think about anything including the story. For the second time period, all participants were told to think about anything. Clark et al. (1991) found that thought suppression led to fewer thoughts in the initial assessment phase and more thoughts in the subsequent phase. In sum, evidence for a rebound effect, but not an immediate enhancement effect, was found.

Marcks and Woods (2007) conducted another study that showed a rebound effect, but not an immediate enhancement effect. They conducted an experiment in which 117 participants underwent a thought action fusion (TAF) induction (i.e., an exercise inducing the belief that having a thought is the moral equivalent of carrying out an action). In the TAF induction, participants were asked to read a sentence out loud in which they said that they hoped that their loved one would be in a car accident. They were subsequently asked to visualize their loved one in a car accident. The TAF induction was followed by two 5-minute time periods of monitoring the frequency of intrusive thoughts related to the TAF induction. During the first time period, participants were assigned to one of three conditions: acceptance, thought suppression, and monitor-only. During the second time period, all participants were instructed to monitor their thoughts.
The monitor only condition was excluded from the analyses because monitor only individuals did not follow instructions to monitor their thoughts about the TAF induction, but instead spontaneously suppressed them. Analysis of the other conditions showed that there were smaller decreases in thought intrusions between the two time periods in the thought suppression condition than in the acceptance condition, suggesting that thought suppression produces difficulties in down-regulating thoughts in the long term compared to an alternative coping strategy, acceptance. The findings may have had clearer implications if the monitor-only control was useable, but, even in comparison with an alternate coping strategy, thought suppression seemed to have undesirable effects on subsequent thought frequency.

While the previous studies showed rebound effects, some studies have shown immediate enhancement effects. For example, Marcks and Woods (2005) conducted an experimental study in which 103 non-clinical participants monitored the frequency of personally relevant intrusive thoughts during three 5-minute time periods. During the first time period, all participants monitored the frequency of their target thought. During the second time period, participants were assigned to conditions in which they were instructed to accept, suppress or only monitor their thoughts, and during the third time period, all participants monitored the frequency of their target thought. Participants in the thought suppression condition had greater thought frequency than participants in the monitor only condition while they were suppressing but not afterwards. Here, suppression seemed to immediately increase thought frequency in the short-term, but did not last in the longer-term follow-up.
In sum, evidence for the negative and counterproductive effects of thought suppression on thought frequency in non-clinical participants has been presented (Clark et al., 1991; Marcks & Woods, 2005, 2007; Wegner et al., 1987). However, there are inconsistencies in the literature. Some studies found immediate enhancement effects, but did not find rebound effects (Marcks & Woods, 2005). Conversely, some studies found rebound effects, but did not find immediate enhancement effects (Clark et al., 1991; Marcks & Woods, 2007; Wegner et al., 1987). In addition, there have been studies that have not found paradoxical effects of thought suppression at all (Muris, Merckelbach, & de Jong, 1993).

Abramowitz, Tolin, and Street (2001) tried to summarize the inconsistent literature by conducting a meta-analytic review of the effects of thought suppression across twenty-eight studies. They found evidence for a small to moderate rebound effect (mean weighted effect size= 0.30), but not an immediate enhancement effect (Abramowitz et al., 2001). These findings suggest that individuals can successfully suppress thoughts over limited periods of time, but as time progresses and suppression efforts weaken, individuals experience a resurgence in thoughts. The meta-analysis also revealed that the longer the suppression period, the larger the immediate enhancement effect (Abramowitz et al., 2001). So, it is possible that the inconsistent findings about the effects of thought suppression may be due in part to the use of different study methodologies such as the duration of the suppression period.

*The effects of thought suppression in individuals with OCD*

In studies involving clinical cases of adults with OCD, evidence for the counterproductive effects of thought suppression has also been found. Janeck and
Calamari (1999) conducted the first experimental study of thought suppression in individuals with OCD. OCD and non-clinical participants monitored the frequency of personally relevant intrusive thoughts during three 5-minute time periods. During the first and third time periods, all participants monitored the frequency of their target thoughts and rang a bell when a target thought occurred. During the second time period, participants were assigned to conditions in which they were instructed to either suppress or only monitor their thoughts. The results showed that there were no overall immediate enhancement or rebound effects of personally relevant intrusive thoughts in the OCD or non-clinical groups. Thought intrusions decreased across time periods across all groups and conditions.

However, when the authors calculated a thought rebound index for each individual in the suppression conditions, they found that a greater percentage of the OCD participants experienced rebound effects than non-clinical participants. So, although only a minority of the suppression participants experienced rebound effects, OCD participants experienced them more frequently than non-clinical participants. So, the study provided minimal evidence of the negative effects of thought suppression on thought frequency for individuals with OCD.

In another experimental study of thought suppression in OCD patients, Tolin, Abramowitz, Przeworski, and Foa (2002), found immediate enhancement effects in individuals with OCD. The study included OCD patients, anxious controls, and non-anxious controls, and there were three five-minute time periods. In all three periods, participants were instructed to say their thoughts out loud, and to hit a keyboard space bar
when they thought or said “white bear.” In the second period, participants were additionally instructed not to think about white bears.

OCD patients reported more white bear thoughts during the suppression condition than baseline (an immediate enhancement effect), while the non-anxious and anxious control participants did not. None of the experimental groups reported increased white bear thoughts after suppression (rebound effect). The findings indicate that thought suppression leads to immediate increases in unwanted thoughts in OCD patients, specifically. This suggests that negative and counterproductive effects of thought suppression may be applicable to OCD patients and may even be more potent than in individuals with non-OCD anxiety or non-anxious controls.

There have also been experimental studies that have not shown counterproductive effects of thought suppression on thought frequency in individuals with OCD (Najmi, Riemann, & Wegner, 2009; Purdon, Rowa, & Antony, 2005). However, some researchers have suggested that the most important target of inquiry may be the discomfort associated with thought suppression rather than the frequency of thoughts (Purdon et al., 2005). The inevitable failures that occur when individuals attempt to suppress thoughts may lead to catastrophizing about the meaning of the failure to control thoughts, leading to additional distress and suppression efforts (Purdon et al., 2005). So, even if thought suppression does not lead to increases in thought frequency, it may negatively affect appraisal and distress about thoughts, thus maintaining symptoms of OCD. For example, in Purdon et al. (2005)’s experimental study, there were no immediate enhancement or rebound effects in individuals with OCD. However, OCD participants who negatively appraised their failures at thought suppression experienced more discomfort over thought recurrences,
more negative mood, and engaged in more efforts to suppress. Thus, distress about thought recurrences may be an important outcome variable to explore in investigating the negative effects of thought suppression in individuals with OCD.

In sum, some experiments have demonstrated negative and counterproductive effects of thought suppression on thought frequency in OCD patients (Janeck & Calamari, 1999; Tolin et al., 2002), while others have not (Purdon et al., 2005). These inconsistencies may be related to important differences in study methodology (Abramowitz et al., 2001). One important difference in study methodology is the duration of the suppression period. Meta-analytic findings suggest that the longer the suppression period, the larger the initial enhancement effect (Abramowitz et al., 2001). In fact, the study of OCD participants that did not find paradoxical effects had a shorter suppression period (4 minutes; Purdon et al., 2005) than the study that found overall immediate enhancement effects (5 minutes; Tolin et al., 2002). So, it is possible that the former study did not find effects because participants were not asked to suppress for long enough.

A second important difference in study methodology is the valence of the target thought. There were no overall paradoxical effects in the reviewed studies of OCD participants that used obsessions as target thoughts (e.g., Janeck & Calamari, 1999; Purdon et al., 2005). On the other hand, the reviewed OCD study that used neutral thoughts did show paradoxical effects (e.g., Tolin et al., 2002). Some researchers have suggested that obsessions are not optimal target thoughts in thought suppression experiments with OCD participants (Tolin et al., 2002). They argue that since individuals with OCD are already using thought suppression on an ongoing basis for their obsessions,
the inclusion of suppression of obsessions in an experimental condition would have little impact on behavior, and the results would not show differences with baseline or monitor only conditions (Tolin et al., 2002). So, thought suppression experiments that used obsessions as target thoughts for individuals with OCD may not have produced significant findings because of a lack of a valid control condition.

A third important difference in study methodology is the type of recording methodology for thought frequency. Some studies used event-marking methods such as clicking on a mouse or ringing a bell when a target thought occurred, (Janeck & Calamari, 1999; Purdon et al., 2005; Tolin et al., 2002), while some additionally used verbalizing a stream of consciousness (Tolin et al., 2002). The advantage of verbalizing is that all the thoughts can be recorded. The disadvantage is that it is more intrusive and may cause participants to behave so that they appear compliant with instructions (Tolin et al., 2002). In the reviewed studies with OCD participants, the study that used both event marking and verbalization demonstrated paradoxical effects (Tolin et al., 2002), while the studies that only used event marking did not (Janeck & Calamari, 1999; Purdon et al., 2005). In sum, thought suppression studies of OCD participants may not show paradoxical effects because of variation in the methods for recording thought frequency.

The effects of thought suppression on thought frequency in children

The literature on thought suppression with child populations is more limited and no experimental studies have targeted childhood OCD. Dempsey, Overstreet, and Moely (2000) investigated the cross-sectional relationship between thought suppression, thought intrusions and distress in inner-city children exposed to community violence. Dempsey et al. (2000) assessed 70 African-American students aged 11 to 14 for exposure to violence,
coping, and PTSD symptoms. They found a relationship between exposure to violence, distress, and re-experiencing symptoms (recurrent thoughts, flashbacks, and hallucinations) in children who more often used cognitive distraction but not in children who used it less often. Although the clinical sample was not of children with OCD, the results are consistent with the theory that thought suppression maintains thought intrusions and anxiety.

There has been one experimental study of thought suppression in non-clinical children (Gaskell, Wells, & Calam, 2001). In this study, 112 children aged 7-11 participated in two experimental time periods. During the first period, children were instructed to either suppress or monitor the frequency of anxious or neutral target thoughts. During the second period, children were instructed to simply monitor the frequency of target thoughts. Gaskell et al. (2001) found no overall counterproductive effects on thought frequency due to thought suppression in children for anxious or neutral target thoughts. Although thought suppression was not complete, children in the suppression condition reported significantly fewer thoughts while suppressing than children in the monitoring condition, indicating that there was no immediate enhancement effect. Also, there were no differences in the frequency of thoughts in the second experimental period between children who had either suppressed or monitored their thoughts in the first experimental period, indicating that there were no overall rebound effects. Since the paradoxical effects that have been found in adult research on thought suppression were not found in this child sample, there may be developmental differences in the effects of thought suppression. It is important to replicate the thought suppression experiment with children and pre-adolescents to determine if this is the case.
However, Gaskell et al. (2001) also found that children with higher state anxiety had higher frequency thought intrusions during suppression for both neutral and anxious thoughts, indicating that suppression was less successful for anxious children in the immediate phase. In addition, it was found that state anxiety was correlated with the number of intrusions in the second time period for children who had previously suppressed anxious thoughts, indicating that anxious children experienced more intrusions after suppressing anxious thoughts than non-anxious children. These findings suggest that thought suppression may be less successful when children are anxious, and that although overall paradoxical effects were not found in this study, it is possible that immediate enhancement and rebound effects would be found in a sample of children with anxiety disorders or OCD.

Acceptance as a Mechanism in OCD

Acceptance is a concept that emphasizes experiencing emotions, thoughts, and sensations without trying to change, control or avoid them (Hayes, Strosahl, & Wilson, 1999). Acceptance of intrusive thoughts could be seen as an opposing process to thought suppression, and may be a beneficial mechanism in OCD by increasing willingness to experience private events. By accepting, rather than suppressing, unwanted thoughts, individuals with OCD may prevent the paradoxical increases in thoughts that suppression creates (Tolin et al., 2002). Also, accepting rather than suppressing unwanted thoughts may reduce distress by preventing the inevitable failures in thought suppression and the accompanying negative meaning that individuals with OCD apply to them (Purdon et al., 2005).
In addition, acceptance may positively impact OCD symptoms by reducing dysfunctional beliefs about the importance, reality and the need to respond to thoughts. Dysfunctional beliefs about thoughts, such as the belief that thoughts are important and are equivalent to action (OCCWG, 1997), are theorized to cause anxiety and trigger compulsions and thought suppression attempts, contributing to the cycle of OCD symptoms (Rassin, Muris, Schmidt, & Merckelback, 2000). Conversely, acceptance de-emphasizes the importance of thoughts, accentuating that they are not real or facts, but are simply internal events that pass through the mind, a psychological process which is called cognitive defusion (Hayes et al., 1999). Strategies aiming to help individuals defuse from thoughts include having individuals imagine that they are watching their thoughts float down a stream on leaves, or that they are watching train cars carry their thoughts from a railway bridge (Hayes & Smith, 2005). Cognitive defusion, as exemplified by these exercises, is theorized to reduce the believability of thoughts and the impact of thoughts on actions. Accordingly, cognitive defusion may be an important process in individuals with OCD that helps them resist acting in accordance with their thoughts, minimizing thought suppression attempts and compulsive behaviors, and ultimately diminishing anxiety about obsessions (Hayes et al., 1996; Orsillo, Roemer, Block-Lerner, LeJeune, & Herbert, 2005).

In sum, acceptance may be an important mechanism in individuals with OCD. It may have a beneficial effect on OCD symptoms by influencing willingness to experience private events, distress about thought occurrences, and the believability and impact of thoughts on actions (Orsillo et al., 2005).

*Effects of acceptance on thoughts, behavior, and distress*
Preliminary evidence for the effects of acceptance on processes hypothesized to be important in OCD is derived from a pain tolerance study with non-clinical adults. Hayes et al. (1999) conducted an experimental study in which the subjective and behavioral impacts on a cold-pressor task of two 90-minute rationales and one 90-minute educational session were tested. In the cold-pressor task, individuals placed their nondominant hand in ice water for as long as possible, and intermittently rated their experience of sensation, unpleasantness, and pain. The acceptance rationale encouraged participants to notice and accept their pain, thoughts, and feelings but to reject these private events as the primary determinants of behavior (i.e., that they should react to the pain). Conversely, the control rationale encouraged participants to regulate their pain through self-talk, breathing, and imagery. It was found that participants in both the acceptance and control conditions reported the same levels of subjective pain, sensation, and discomfort. However, participants who received the acceptance rationale kept their hands underwater longer than participants who received the control rationale. In addition, after the intervention, participants who had received the acceptance rationale reported the least believability of pain as a reason for behavior. Thus, acceptance strategies increased willingness to experience unpleasant private events of pain and reduced the impact of private events on behavior.

Related evidence that acceptance affects processes important to OCD can be derived from an acceptance-based treatment study to prevent the rehospitalization of psychotic patients (Bach & Hayes, 2002). Bach and Hayes (2002) randomly assigned 80 inpatients to treatment as usual (TAU) or to TAU plus four sessions of Acceptance and Commitment Therapy (ACT) which included strategies to notice and accept thoughts and
perceptions rather than believing and acting on them. ACT participants were rehospitalized at lower rates and after longer periods of time than TAU over a four-month follow-up period, and the differences were not explained through medication compliance or symptom frequency. In fact, more ACT participants reported symptoms than TAU participants over the four-month period. In addition, there were no differences in the self-reported distress associated with symptoms between TAU and ACT participants. But, ACT participants had lower believability of symptoms than TAU participants. The results suggest that ACT participants experienced a decrease in the believability and impact of their psychotic symptoms, which in turn, reduced hospitalization. Here, believing and responding less to the psychotic symptoms was more important than frequency of occurrence in determining actual behavioral outcomes.

Additional preliminary evidence that acceptance affects processes and outcomes important to OCD is derived from an acceptance-based treatment study for adults with OCD. Twohig et al. (2006) conducted an 8-session trial of ACT for four adults with OCD. The treatment included cognitive defusion exercises such as rapidly repeating the obsession until it no longer sounded like the obsession but a funny string of sounds, and viewing thoughts as signs on soldiers marching by in a parade. All four participants experienced significant decreases in self-reported compulsions and anxiety by post-treatment. There were also decreases in all participants across treatment in experiential avoidance, believability of obsessions, and urges to respond to obsessions.

The findings from the abovementioned studies are consistent with a theory that acceptance may improve OCD symptoms by increasing the willingness of individuals with OCD to experience internal sources of distress (intrusive thoughts) and decreasing
the believability and impact on behavior of the intrusive thoughts (compulsions, avoidance). However, only experimental studies of individuals with OCD can identify the direction of the relationship between the variables and deduce whether acceptance of intrusive thoughts plays a causal role in these important OCD processes.

*Experimental studies of acceptance of intrusive thoughts*

There have been only three experimental studies examining the effects of acceptance of intrusive thoughts (Marcks & Woods, 2005, 2007; Najmi et al., 2009). As previously described, Marcks and Woods (2005) conducted a study in which non-clinical participants monitored the frequency of personally relevant intrusive thoughts during three 5-minute time periods. During the second time period, participants were instructed to accept, suppress or only monitor their thoughts. Participants in the acceptance condition were instructed to mindfully watch their thoughts as if they were coming out of their ears on signs held by marching soldiers. They were instructed not to argue with or avoid the signs. Participants in the acceptance condition experienced as many thoughts as the suppression and monitor-only conditions during the second time period. However, acceptance participants experienced greater decreases in discomfort with their target thought compared to the other conditions from the second to the third time period. These findings support the theory that acceptance may reduce distress associated with intrusive thoughts. These results were in contrast to the thought suppression condition which showed greater immediate thought frequency than the monitor-only condition, and greater subsequent discomfort about thoughts compared to both monitor-only and acceptance conditions.
Also previously described, Marcks and Woods (2007) conducted an experimental study of the effects of acceptance in coping with intrusive thoughts. Participants underwent a TAF induction, followed by two 5-minute time periods of monitoring the frequency of intrusive thoughts. During the first time period, participants were instructed to accept, suppress, or monitor their thoughts. Participants in the acceptance condition were given similar instructions as in the Marcks and Woods (2005) experimental study described above. Results showed that acceptance participants had more thought intrusions than the thought suppression participants during the first time period, but experienced greater decreases in thought frequency thereafter. The results also showed that there were no differences between acceptance and thought suppression in anxiety reduction between the first and second time periods. Finally, acceptance participants reported greater willingness to re-experience the thought after the second time period. These results support the theory that acceptance may increase willingness to experience intrusive thoughts.

In an experimental study of OCD and non-clinical participants, Najmi et al. (2009) measured unwanted thought intrusions and distress changes during and after thought suppression, acceptance, and focused distraction. The procedure comprised of one 5-minute baseline thought monitoring task, two 5-minute periods of engaging in the mental control task (acceptance, thought suppression, focused distraction) followed by one 5-minute period with no mental control instructions. Najmi et al. found that in the OCD groups, after the experimental tasks, thought suppression led to a rebound in distress, acceptance led to reductions in distress, and distress remained low during and after focused distraction. No between-condition significant differences on thought
frequency were identified. These results suggest that acceptance may have an ameliorative effect on distress associated with intrusive thoughts.

The abovementioned experimental results are supportive of the theory that acceptance improves OCD symptoms. They indicate that acceptance leads to greater willingness to experience intrusive thoughts and greater decreases in distress about intrusive thoughts than thought suppression in non-clinical individuals. Change in these important OCD processes could lead to additional positive effects, such as decreased thought suppression attempts and negative paradoxical effects. Further studies on the experimental effects of acceptance in individuals with OCD, in particular, are necessary to clarify whether acceptance is a beneficial alternative coping strategy to thought suppression and possible mechanism of change in OCD.

**Acceptance as a mechanism in childhood OCD**

As in the child literature on thought suppression, there are few studies assessing the specific effects of acceptance in childhood OCD. As a result, it is necessary to draw indirect evidence from a wider literature. One indirect line of evidence comes from the coping literature. Broadly speaking, the use of engagement coping, or those strategies directed toward the stressor (such as acceptance), has been associated with fewer anxiety and depression symptoms in youth (Compas et al., 2001).

On the other hand, in a study of coping, Silk et al. (2003) found that non-clinical adolescents who frequently used disengagement coping reported more psychopathological symptoms, while there were no significant associations between engagement coping and psychopathology. This pattern of results could indicate that it is more important for youth to be taught not to avoid or disengage from feared stimuli, but
rather to experience and accept them, than it is for them to use any particular engagement
coping strategy. These findings are consistent with a theory that acceptance is an
important mechanism in adolescent internalizing symptoms. However, the results do not
provide any implications about the possible impact of acceptance specifically in
childhood OCD.

Another indirect line of evidence that supports acceptance as a mechanism in
childhood OCD is from treatment research. Interventions that focus on experiencing the
thoughts and emotions associated with the stressor have been helpful for child OCD
(King et al., 1998). In fact, the central element of the first-line treatment for child OCD,
CBT, is ERP, or exposing the child to the feared stimulus and preventing avoidance or
rituals (POTS Team, 2004). The theory and the success of ERP are consistent with the
idea that acceptance could be an important change mechanism in childhood OCD.

There have been very few acceptance-based treatment studies in the child domain,
and none with children with OCD. However, one treatment study of ACT for adolescents
with chronic pain demonstrates evidence that acceptance affects processes theorized to be
important in childhood OCD. Wicksell, Melin, and Olsson (2007) conducted an exposure
and acceptance pilot treatment study for adolescents with idiopathic chronic pain. ACT
was conducted with 14 adolescents aged 13-20 (Hayes et al., 1999). The treatment
encouraged acceptance of unpleasant experiences and thoughts, and discouraged
avoidance of the pain. Participants were instructed to distance themselves from their
thoughts to reduce their negative impact on behavior. Improvements in school
attendance, catastrophizing and pain intensity and interference occurred by the end of
treatment.
Although limited by low sample size and lack of a control condition, the results suggest that acceptance reduced the impact of thoughts about pain on adolescent behavior, evidenced through decreases in catastrophizing and avoidant behavior. These findings suggest the importance of and possible role for acceptance in children with OCD, who would also benefit from reductions in the negative influence that certain thoughts have on their behavior (e.g., compulsions, thought suppression). The results also indicate, importantly, that acceptance may be a feasible strategy for use with youth.

Future research studies of acceptance-based strategies in children with OCD are essential to determine their specific capacity to positively impact anxiety, obsessions, and compulsions. Although initial acceptance research has been conducted in adult samples, virtually no studies of acceptance exist in children, and none in OCD children.

Acceptance-based approaches may have differing responses in children than adults. Some theorize that acceptance may be less beneficial and feasible in children because of its abstract and complex nature (Murrell, Coyne, & Wilson, 2004). On the other hand, some suggest that acceptance-based approaches are suitable for children because they make use of developmentally appropriate teaching strategies such as metaphors (Murrell et al., 2004). Moreover, preliminary studies have shown acceptance-based approaches to be successful in treating children (Wilson & Coyne, 2003), adolescents (Wicksell et al., 2007), and adults with cognitive impairments (Bach & Hayes, 2002). So, the conflicting theories and preliminary evidence make it unclear whether children with OCD would respond differently to acceptance than adults with OCD. Similarly, results from child thought suppression studies suggest that there may be developmental differences in the way that thought suppression affects individuals.
(Gaskell et al., 2001). In sum, it is important to assess thought suppression and acceptance in childhood OCD to determine if children with OCD respond in dissimilar ways from adults with OCD.

Current Study

The current study examined the effects of thought suppression and acceptance on thought frequency, self-reported distress, believability of thoughts, urge to push away intrusive thoughts, and willingness to experience thoughts. Youth participants were recruited for presence of elevated intrusive thoughts (CYBOCS Obsessions ≥ 6) and most (95.8%) met criteria for a clinical disorder (half met criteria for OCD).

Clinical participants were randomly assigned to one of two emotion regulation conditions: Thought Suppression and Acceptance, in which children were instructed to use a specific emotion regulation strategy while monitoring their thoughts. Participants participated in a five phase repeated assessment group comparison design, including a 5-minute instructions period, 5-minute pre-experiment phase, a 4-minute baseline period, a 4-minute experimental period, and a 4-minute return to baseline period. Participants completed assessments before, after, and throughout each phase, which included measures of distress and obsessions at baseline, experimental period, and return to baseline. See Figure 1 for study timeline.

Hypotheses

Hypothesis 1: Acceptance will result in greater increases in thought count frequency, subjective thought frequency, and distress about thoughts from baseline to the experimental period than Thought Suppression (no immediate enhancement). Hypothesis 2: Acceptance will result in greater decreases in thought count frequency, subjective
thought frequency, and distress than Thought Suppression after the experimental period: between the experimental and return to baseline periods (rebound effect).

Hypothesis 3: Acceptance will result in lower believability, urge to push away, and higher willingness to continue thinking about target thoughts than Thought Suppression during the experimental time period, controlling for baseline measures.

Hypothesis 4: Acceptance will result in lower believability, urge to push away, and higher willingness to continue thinking about target thoughts than Thought Suppression during the return to baseline period, controlling for baseline measures.

Hypothesis 5: Self-rated efforts to suppress will be positively correlated with the frequency, distress, believability, and urge to push away target thoughts, and negatively correlated with the willingness to continue thinking about target thoughts during the baseline period. Hypothesis 6: Self-rated levels of acceptance will be negatively correlated with the frequency, distress, believability, and urge to push away target thoughts, and positively correlated with the willingness to continue thinking about target thoughts during the baseline period.

Methods

Participants

Twenty-four children served as participants (13 participants in the Acceptance condition; 11 participants in the Thought Suppression condition). Age range was from 8 to 18 years (M= 11.87; SD = 2.75), and 58.3% of the sample was male. Participant ethnicity was 88.6% Caucasian, 2.3% Asian, 6.8% Latino, 2.3% African-American. Participants were selected for presence of intrusive thoughts at phone screening and CYBOCS-Obsession score (≥ 6). Mean CYBOCS-Obsession score was 10.33 (SD =
2.51; range = 6-15), mean CYBOCS-Compulsions was 9.79 (SD = 3.56; range = 0-15),
and mean CYBOCS Total was 20.12 (SD = 5.24; range = 11-29), all in the clinical range
of intrusive thoughts and compulsion symptoms (POTS Team, 2004).

Of the 24 participants, 23 (95.8%) had clinical diagnoses. Eleven (45.8%) had a
primary diagnosis of OCD, eight (33.3%) had a primary diagnosis of GAD, two (8.3%) had a primary diagnosis of Tourette Syndrome (TS), one (4.2%) had a primary diagnosis of Separation Anxiety Disorder (SAD), and one had a primary diagnosis (4.2%) of attention deficit hyperactivity disorder (ADHD). Of the 23 participants with clinical diagnoses, 13 (54.0%) had one or more comorbid anxiety disorders (e.g., OCD, GAD, Separation Anxiety Disorder, Social Phobia, Specific Phobia, Anxiety Disorder NOS), 7 (30.0%) had one or more comorbid depressive disorders (e.g., Major Depressive Disorder, Dysthymia), 7 (30.0%) had one or more comorbid externalizing disorders (e.g., ADHD, Oppositional Defiant Disorder, Conduct Disorder, Disruptive Behavior Disorder), 5 (22.0%) had comorbid tic disorders (e.g., TS, Transient Tic Disorder), 2 (22.0%) had comorbid trichotillimania, 1 (4.0%) had comorbid Asperger’s Disorder, and 1 (4.0%) had comorbid bipolar disorder. Six (26.0%) of the participants with clinical diagnoses had no comorbidity. The mean number of diagnoses per participant was 2.96. Of the participants, 50.0% had a diagnosis (either primary or not) of OCD, 54.2% were on psychotropic medication (e.g., Zoloft, Prozac, Concerta), and 66.7% were currently in psychotherapy. Fourteen (58.3%) of the participants were in current CBT. Of these, 8 (57.1%) had been in treatment for two months or less. Exclusion criteria included presence of psychosis or autism, as reported by parent. No children were excluded for these reasons.
Measures

*Children’s Yale-Brown Obsessive Compulsive Scale (CY-BOCS).* The CY-BOCS (Scahill et al., 1997) is a 10-item, clinician-administered, semi-structured instrument that assesses the presence and severity of obsessions and compulsions over the previous week on a five-point Likert scale from 0 to 40. It has demonstrated good internal consistency, interscale correlations, test-retest stability, and convergent and divergent validity (Storch et al., 2004). Researchers use the CY-BOCS cutoff score of 16 as representing clinically significant OCD-combined type symptomatology, the CYBOCS Obsessions sub-scale cutoff score of 8 as representing clinically significant obsessions, and the CYBOCS Compulsions subscale cutoff score of 8 as representing clinically significant compulsions (POTS Team, 2004). Researchers have used CYBOCS total scores of 4 to 15 as representing sub-clinical OCD symptoms (Reddy et al., 2003).

*Frequency Counter.* Participants recorded frequency of targeted intrusive thought by pressing a computer keyboard during the experiment. Previous experiments of thought suppression and acceptance have used similar event marking procedures and have found significant effects with bells (Wegner et al., 1987), frequency counters (Marcks & Woods, 2005, 2007), and keyboard keys (Tolin et al., 2002). Thought suppression experiments that used verbalization of the content of thoughts as a procedure to count frequency have shown stronger paradoxical effects (Tolin et al., 2002), but this tactic was determined to be too difficult for children as young as 9 years old. Also, verbalization is more intrusive and may produce a desire to appear compliant with instructions.

*State-Trait Anxiety Inventory for Children (STAIC) – State scale.* The STAIC-State (Spielberger, 1973) is a 20-item self-report scale that assesses temporal and
situational variations in anxiety scored on a scale from 0 to 60 (A-State). Evidence for the
STAIC's discriminant and convergent validity has been reported (Hodges, 1990).

*Subjective Units of Obsessions (SUO) rating.* SUO is a self-report seven-item
assessment of the subjective experience of obsessions (frequency, distress, believability,
urge to push away, willingness to continue thinking about the target obsession), and
effort to suppress, accept, and be mindful of the target thought. It was conducted after
each experimental time period (baseline, experimental, and return to baseline). Each of
the items is rated on a 101-point scale from 0 (not at all) to 100 (very, very much). In a
study with a similar paradigm, the use of analogous single item measures with rating
scales from 1 to 10 successfully measured change in subjective frequency of thoughts and
distress about thoughts across study time periods (Marcks & Woods, 2005). In addition,
single item visual analog scales of distress, thought suppression, urge to do something
about the target thought, and willingness to think about target thought from 0 (not at all)
to 100 mm (extremely) have effectively measured change across study time periods
(Marcks & Woods, 2007).

To assess the effectiveness of the manipulation, five additional questions were
added to the SUO for the administration after the experimental period. Three open-ended
questions assessed coping strategy employed, and one open-ended question assessed
barriers to following instructions. One question assessed adherence to instructions using a
1 (not at all) to 5 (all of the time) rating scale. Similar paradigms have used single item
report rating scales that have effectively assessed adherence to instructions (Marcks &
Instructions Comprehension Check (IC Check). The IC Check is a one-item experimenter-report measure created for this study that assesses youth understanding of the instructions presented before the baseline, experimental, and return to baseline time periods. The IC Check assesses whether the child is able to explain the instructions to the experimenter, and how many times it is necessary for the experimenter to repeat the instructions to the child. These methods are based on the procedures in a study of thought suppression in children (Gaskell et al., 2001). In Gaskell et al. (2001), children who did not understand the instructions after twice hearing them were excluded. In this study, experimenter assessment of comprehension was conducted after instructions were given and after children practiced the task one or two times.

Procedures

Recruitment

Thirty (N=30) participants were recruited through three general sources: 1) youth seeking services at two specialty outpatient research clinics in the Department of Psychology at a large northeastern public university (n=24), 2) youth seeking services at a specialty outpatient research clinic in the Department of Psychiatry at a large northeastern medical school (n=2), and 3) broad-based community advertisement (n=4). Recruitment at the research clinics consisted of distributing flyers to families of existing clients or by describing the study to new cases at a phone screening. Families who gave permission were then contacted by the principal investigator who conducted a brief telephone screening to assess inclusion (intrusive thoughts) and exclusion (autism, psychosis) criteria. If eligible, families were scheduled for a 60-75-minute study session that included initial assessment and experiment (described below). For broad-based
community advertisement, descriptive flyers were distributed to directors and therapists of community clinics who posted them in their waiting rooms and disseminated them to relevant cases. Advertisements were also placed in relevant newsletters. Families who learned about the study via community clinics or newsletter announcements used the contact information provided by the advertisement to contact the principal investigator.

The principal investigator then conducted the telephone screen, and if eligible and interested, interested families were scheduled for a study session. Compensation for study participation was a $20 Target gift card.

At the recruitment stage, one participant was excluded due to suspected mental retardation (by parent report) and concerns about the child’s ability to understand study instructions. At the analytic stage, five participants were removed from the analyses after study participation due to suspicion of invalid data. Specifically, two participants were removed because they could not adequately describe the task they were about to do (failed IC Check). One was removed because the experiment was interrupted and moved to a noisy and distracting location. One was removed because he appeared to have difficulty attending to the experimental tasks due to contamination concerns unrelated to the target thought. Finally, one was removed because the experimenter went over the time limit for recording target thoughts.

_Experimenter Characteristics_

The experiment was conducted by four advanced doctoral students in clinical psychology (one of whom was the principal investigator). The principal investigator trained the other three experimenters over three training sessions to conduct and score the CYBOCS and to execute the experimental paradigm. Experimenters were each observed
in one training trial and given feedback before they could administer the experiment independently. The principal investigator provided supervision of the experimenters after each running of the experiment to ensure proper implementation of the paradigm and to make a determination about whether the data were valid.

Assessment Phase

Participants first attended an initial assessment session, where child and parent jointly completed the CYBOCS with an interviewer, and a target thought was identified for the experiment. The investigator provided verbal feedback about the severity range of the CY-BOCS score. If the child had obsessions with a CY-BOCS-Obsessions Subscale \( \geq 6 \), the child was asked to continue with the experiment. Families were given the option of continuing with the experiment on the same day or scheduling it on a different day.

Some families referred by two of the research clinics had previously and recently completed CYBOCS as part of their natural clinic intake process. For these families, they did not repeat the entire CYBOCS interview, but the experimenter reviewed the CYBOCS with the family to confirm the presence of clinically significant obsessions, and to identify a target thought for the experiment.

Experimental Phase

Participants returned for a second experimental phase, were randomly assigned to either the Acceptance or Thought Suppression condition, and then completed five experimental phases: (1) instructions and practice, (2) pre-experiment, (3) baseline, (4) experimental period, and (5) return to baseline period (see Figure 1). There were four main assessment points (pre-experiment, baseline, experimental, and return to baseline).
Repeated measurement of child-reported obsessions occurred over the course of the experiment.

Pilot work has shown that children aged 7 through 11 have trouble concentrating for more than two minutes on thought monitoring and suppression tasks (Gaskell et al., 2001). Although adult studies of thought suppression have used suppression time periods from 2 to 9 minutes, studies that use suppression periods of longer duration show stronger paradoxical effects (Abramowitz et al., 2001). In order to include tasks that were developmentally appropriate for our youth sample aged 8 to 18 (taking the results of the pilot study into consideration, see below) and to maximize the probability of finding effects, we chose four minutes as the suppression time period.

Instructions. The instructions period was a 5-minute period during which the experimenter explained the experiment and assessments. The experimenter explained that participants would be keeping track of their thoughts over three time periods, and that during one of the time periods the participants would be given a strategy for managing unwanted thoughts.

Pre-experiment Phase. The pre-experiment phase was a 5-minute period following the presentation of instructions and preceding baseline. Participants completed the STAIC-State. Youth were also asked to confirm their most upsetting obsession identified in the CY-BOCS. This obsession was used as the target thought for the experiment.

Instructions and Practice for Baseline Period. The participant was instructed to “Think about anything including (the target thought), and press the key if you think about (the target thought). Continue in the same way for the full 4 minutes.” The experimenter
asked the participants to repeat back the instructions to the experimenter to confirm that they understood. If the participant did not understand the instructions, the experimenter repeated the instructions again. The participants were shown how to count thoughts by pressing a key on a computer keyboard. The participant practiced counting thoughts about a purple elephant for 1 minute. The experimenter assessed for understanding and completed the IC Check for comprehension. The participant was given a second opportunity to practice if understanding was not adequate after one practice. When the participant demonstrated understanding, the experimenter primed the target thought by asking the participant to describe it, and to visualize it for 30 seconds.

**Baseline Period.** Baseline was a 4-minute period following the pre-experiment phase. The experimenter said, “When I say begin, you will begin. You will think about anything you want including (the target thought), but if you think about (the target thought), you will press the key. Are you ready? Ok, begin!” Participants monitored their thoughts and recorded the occurrence of the target thought by pressing the key.

**Baseline Assessment.** At the conclusion of the baseline period, the experimenter said, “Good job. Now I am going to ask you a few questions,” and conducted the baseline assessment, which is a 3-minute assessment and includes the SUO.

**Instructions and Practice for Experimental Period.** There have been no previous experimental studies of acceptance or mindfulness-based strategies with children that could guide our choice of coping strategy. However, in their review chapter on integrating acceptance and mindfulness into treatments for child and adolescent anxiety disorders, Greco, Blackledge, Coyne & Ehrenreich (2005) suggest the use of a developmentally appropriate metaphor to increase cognitive defusion in children.
Children were instructed to experience their thoughts as a continuous stream of bubbles in front of their face. When they had a thought, children were to place it in a bubble and observe it without grabbing at the bubbles or blowing them away. We chose this acceptance metaphor as our experimental intervention because it is adapted to children’s developmental level and targeted crucial acceptance processes that we were interested in assessing.

After the baseline assessment, the participants were given appropriate instructions for their condition. Children assigned to the Acceptance condition were told the Acceptance script (see Appendix A), and children assigned to the Thought Suppression condition were told the Thought Suppression script (see Appendix A).

For each instructions condition, the experimenter asked the children to repeat the instructions back to them to ascertain whether they understood. If the participant did not understand the instructions, the experimenter repeated the instructions again. The participant then practiced doing the acceptance or thought suppression exercise with thoughts about a purple elephant for 1 minute. After the practice period, the experimenter assessed for understanding and complete the IC Check to rate comprehension. The participant was given a second opportunity to practice if understanding was not adequate after one practice. When the participant demonstrated understanding, the experimenter primed the target thought by asking the participant to describe it, and to visualize it for 30 seconds.

*Experimental Period.* The experimental period was a 4-minute period after the baseline phase. The experimenter gave the appropriate instructions for the participant’s condition. Participants monitored their thoughts, used the emotion regulation instructions
for their condition, and recorded the occurrence of the target thought by pressing the keyboard key.

*Experimental Assessment.* At the conclusion of the experimental period, the experimenter said “Good job. Now I am going to ask you a few questions,” and conducted the experimental assessment, which is a 3-minute assessment and includes the SUO.

*Instructions for Return to Baseline.* The participant was instructed to “Think about anything including (the target thought), and press the key if you think about (the target thought). Continue in the same way for the full 4 minutes.” The experimenter asked the participants to repeat back the instructions to the experimenter to confirm that they understand. If the participant did not understand the instructions, the experimenter repeated the instructions again. The experimenter completed the IC Check for comprehension.

*Return to Baseline Period.* Return to Baseline was a 4-minute period after the experimental phase. The experimenter said, “When I say begin, you will begin. You will think about anything you want including (the target thought), but if you think about (the target thought), you will press the key. Are you ready? Ok, begin!” Participants monitored their thoughts and recorded the occurrence of the target thought by pressing the key.

*Return to Baseline Assessment.* At the conclusion of the return to baseline period, the experimenter said “Good job. Now I am going to ask you a few questions,” and conducted the return to baseline assessment, which is a 3-minute assessment and includes the SUO.
Debriefing: At the conclusion of the experiment, the experimenter met with the parents and the youth participant to give more information about the study and answer questions. The experimenter said, “In this experiment, we wanted to see which types of coping are the most helpful to kids with anxious thoughts. We wanted to see if certain strategies changed how many upsetting thoughts kids have, or how kids felt about their upsetting thoughts.” The experimenter asked the youth participant, “Did you notice anything? Did what you did seem helpful?” The experimenter asked the family and youth, “Do you have any questions for me about the experiment?” The experimenter thanked the family for their help with the study.

Pilot Study

Prior to enrolling study participants, four female children, ages 9 – 14, without psychological disorders participated in study protocol to test feasibility and acceptability of study methods and clarity of instructions used with youth. Two children were assigned to the Acceptance condition and two were assigned to the Thought Suppression condition. Based on results and participant feedback, piloting work produced several changes to the final protocol. The duration of time periods was changed from three to four minutes because children reported and demonstrated the ability to follow the study instructions for as long as four minutes, and greater paradoxical effects have been associated with the use of longer periods of suppression (Abramowitz et al., 2001). Suppression instructions were modified to clarify that suppression would occur throughout the experimental time period and that the child could use any suppression strategy (e.g., study-recommended strategy or one that they had used successfully in the past). Instructions were modified to clarify that children could think about whatever they
wanted to during the experimental paradigm (except for suppression condition during the experimental period), and that children could let their minds wander as if they were waiting for someone. Finally, manipulation check questions were moved to after the experimental period rather than at the end of the entire experiment because children reported it would be easier to remember what they had done in the experimental period if the questions occurred right afterward. These changes are reflected in the final experimental procedures listed above.

Results

Sample Characteristics of Experimental Conditions

Initial t-test and chi square analyses were conducted to check for differences between the Acceptance and Thought Suppression conditions in demographic characteristics (age, gender), CYBOCS scores, and pre-experiment affect (STAIC-State). Results did not show significant differences in age of participants between Acceptance ($M = 12.23$, $SD = 2.52$) and Thought Suppression ($M = 11.40$, $SD = 3.10$) conditions, $t(21) = 0.71, p = .49$. There was not a disproportionate association between experimental condition and gender of participants, $\chi^2(1) = 0.24, p = .63$. Gender in the Acceptance (7 Males, 6 Females) and Thought Suppression (7 Males, 4 Females) conditions was similar.

Results did not show differences in CYBOCS Obsessions Subscale scores between Acceptance ($M = 10.23$, $SD = 2.09$) and Thought Suppression ($M = 10.45$, $SD = 3.05$) conditions, $t(22) = -0.21, p = .83$, in CYBOCS Compulsion Subscale scores between Acceptance ($M = 10.70$, $SD = 2.81$) and Thought Suppression ($M = 8.73$, $SD = 4.17$) conditions, $t(22) = 1.37, p = .18$, and in the CYBOCS Total scores between
Acceptance ($M = 20.92, SD = 4.55$) and Thought Suppression ($M = 19.18, SD = 6.03$) conditions, $t(22) = .81, p = .43$.

Results did not show significant differences in pre-experiment anxiety (STAIC-State) scores between Acceptance ($M = 46.85, SD = 3.36$) and Thought Suppression ($M = 44.91, SD = 3.67$) conditions, $t(22) = 1.35, p = .19$. The mean overall score for participants for pre-experiment anxiety (STAIC-State) was 45.96 ($SD = 3.57$; range = 41-52), which is about two standard deviations (98th percentile) above the mean of comparable normative samples.

*Experimental Manipulation*

To determine whether there were differences between the emotion regulation conditions in the degree to which children followed the emotion regulation instructions, an independent samples t-test was run comparing the proportion of time that children in each experimental condition reported following the instructions during the experimental period. Mean scores on the instruction-following item on the SUO administered after the experimental period did not show significant differences between Acceptance ($M = 4.00, SD = 1.08$) and Thought Suppression conditions ($M = 4.27, SD = 0.905$), $t(22) = -0.66, p = .51, d = 0.27$.

Effectiveness of experimental manipulation was tested with a one-way ANCOVA to determine differences in level of acceptance during the experimental period, controlling for level of acceptance during baseline. Significant differences were found between conditions in level of self-reported acceptance (single item on SUO) during the experimental period, $F(1, 21) = 12.95, p = .002, \eta_p^2 = 0.38$, with the Acceptance condition ($M = 63.85, SD = 32.35$) having a higher level of “letting the thought be there
without pushing it away” than the Thought Suppression condition ($M = 19.18, SD = 20.99$).

Conditions were then compared on effort to suppress target thoughts during the experimental, controlling for effort to suppress during the baseline period. Significant differences were not found on effort to suppress between Acceptance ($M = 53.85, SD = 38.03$) and Thought Suppression conditions ($M = 74.45, SD = 23.55$), $F(1, 21) = 3.01, p = .10$, $\eta_p^2 = 0.13$.

**Main Hypotheses:**

To test the main study hypotheses (Hypotheses 1 and 2), a $3 \times 2$ (Time: baseline, experimental, return to baseline) x 2 (Condition: Acceptance, Thought Suppression) mixed-model ANOVA was conducted for each of the main dependent variables (thought frequency counts, subjective thought frequency, distress about thoughts) to determine main and interaction effects. Planned repeated contrasts were then executed to examine between- and within-condition effects both within and across experimental periods. For $\eta_p^2$, the thresholds for small, medium and large effects are 0.01, 0.06, and 0.14.

Table 1 provides descriptive statistics of all dependent variables across experimental time periods. Figures 2 through 7 provide graphic displays of mean dependent variables across time periods to aid interpretation (Figure 2 for thought count frequency, Figure 3 for subjective thought frequency, Figure 4 for distress, Figure 5 for believability, Figure 6 for urge to push away, and Figure 7 for willingness to continue thinking about target thoughts).

**Thought Count Frequency**
A 3x2 ANOVA with thought count frequency as the dependent variable showed no significant main effect of emotion regulation condition, $F(1, 22) = 0.52$, $p = .48$, $\eta^2_p = 0.02$, indicating no differences in count frequency between the Acceptance and Thought Suppression conditions controlling for all other variables (see Table 2). There was a significant main effect of time period for thought count frequency, $F(2, 44) = 3.72$, $p < .05$, $\eta^2_p = 0.15$, but the time period by condition interaction was not significant for thought count frequency, $F(2, 44) = 0.08$, $p = .92$, $\eta^2_p = 0.004$.

Planned repeated contrasts were performed comparing each level of time period to its successive time period (e.g., baseline vs. experimental, experimental vs. return to baseline). These revealed thought count frequency decreased significantly from baseline to experimental period, $F(1, 22) = 10.99$, $p < .01$, $\eta^2_p = 0.33$, while it did not change significantly from experimental to return to baseline period, $F(1,22) = 0.27$, $p = .61$, $\eta^2_p = 0.01$. Repeated contrasts were also performed comparing successive levels of time period to each level of condition and confirmed nonsignificant results from the interaction effect. Changes in thought count frequency between the baseline and experimental periods, $F(1, 22) = 0.06$, $p = .81$, $\eta^2_p = 0.003$, and between the experimental and return to baseline periods, $F(1, 22) = 0.14$, $p = .71$, $\eta^2_p = 0.01$, showed no differences in the Acceptance and Thought Suppression conditions. Since thought count frequency count in the Acceptance and Thought Suppression conditions did not change in a significantly different way across study time periods, these results do not show evidence of an immediate enhancement or a rebound effect.

*Subjective Thought Frequency*
A 3x2 ANOVA with subjective thought frequency as the dependent variable showed no significant main effect of emotion regulation condition for subjective thought frequency, $F(1, 20) = 0.94, p = .35, \eta_p^2 = 0.05$, indicating nonsignificant differences in subjective thought frequency between Acceptance and Thought Suppression conditions (see Table 3). There was a significant effect of time period for subjective thought frequency, $F(2, 40) = 4.93, p < .05, \eta^2 = 0.20$, but the time period by condition interaction was not significant for subjective thought frequency, $F(2, 40) = 1.05, p = .36, \eta_p^2 = 0.05$.

Planned repeated contrasts were performed comparing each level of time period to its successive time period (e.g., baseline to experimental, experimental to return to baseline). These revealed subjective thought frequency decreased significantly from baseline to experimental period, $F(1, 20) = 5.03, p < .05, \eta_p^2 = 0.20$, while it did not change significantly from experimental to return to baseline period, $F(1, 20) = 0.34, p = .57, \eta_p^2 = 0.02$. Repeated contrasts were also performed comparing successive levels of time period to each level of condition and confirmed results from the interaction effect. Changes in subjective thought frequency between the baseline and experimental periods, $F(1, 20) = 0.04, p = .85, \eta_p^2 = 0.002$, and between the experimental and return to baseline periods, $F(1, 20) = 0.04, p = .14, \eta_p^2 = 0.10$, were not significantly different in the Acceptance and Thought Suppression conditions. Since subjective thought frequency in the Acceptance and Thought Suppression conditions did not change in a significantly different way across study time periods, these results do not show evidence of an immediate enhancement or a rebound effect.

*Distress*
A 3x2 ANOVA with subjective thought frequency as the dependent variable showed no significant main effect of emotion regulation condition on distress about target thoughts for the Acceptance and Thought Suppression conditions, $F(1, 22) = 0.06, p = 0.80, \eta^2_p = 0.003$, indicating nonsignificant differences in distress for the Acceptance and Thought Suppression conditions (see Table 4). There was a significant main effect of time period, $F(2, 44) = 7.12, p < .01, \eta^2_p = 0.24$, but the time period by condition interaction was not significant for distress, $F(2, 44) = 1.38, p > .05, \eta^2_p = 0.06$.

Planned repeated contrasts were performed comparing each level of time period to its successive time period (e.g., baseline to experimental, experimental to return to baseline). These revealed distress decreased significantly from baseline to experimental period, $F(1, 22)= 7.83, p < .05, \eta^2_p = 0.26$, while it did not change significantly from experimental to return to baseline period, $F(1, 22) = 0.51, p = .48, \eta^2_p = .02$. Repeated contrasts were also performed comparing successive levels of time period to each level of condition, and confirmed the results of the interaction effect. Changes in distress between baseline and the experimental periods, $F(1, 22) = 1.67, p = .21, \eta^2_p = 0.07$, and between the experimental and return to baseline periods, $F(1, 22)= .04, p = .85, \eta^2_p = 0.002$, were not significantly different in the Acceptance and Thought Suppression conditions, indicating that the hypotheses about distress were not confirmed.

Believability, Urge to push away, Willingness to Continue Thinking

To assess secondary hypotheses (Hypotheses 3 and 4), a series of one-way ANCOVAs were conducted to assess between-condition (Thought Suppression, Acceptance) differences at each time period (experimental, return to baseline). Main effects were calculated for each secondary dependent variable (believability, urge to push
away target thought, willingness to continue thinking about target thought) at the experimental and return to baseline period, controlling for baseline period.

For believability, no significant between-condition differences were found during the experimental period, controlling for baseline believability, $F(1, 21) = 0.001, p = .98, \eta_p^2 = 0.001$ (see Table 5). For urge to push away, no significant differences were found during the experimental period, controlling for baseline urge to push away, $F(1, 21) = 0.64, p = .43, \eta_p^2 = 0.03$ (see Table 5). For willingness to continue thinking, no significant differences were found during the experimental period, controlling for baseline willingness to continue thinking, $F(1, 19) = 0.78, p = .39, \eta_p^2 = 0.04$ (see Table 5).

A series of one-way ANCOVAs was conducted to compare Thought Suppression and Acceptance on return to baseline period scores of believability, urge to push away, and willingness to continue thinking, controlling for baseline scores (baseline scores were entered as a covariate; Hypothesis 4). For believability, no significant between condition differences were found during the return to baseline period, controlling for baseline believability, $F(1, 21) = 1.08, p = .31, \eta_p^2 = 0.05$ (see Table 6). For urge to push away, no significant differences were found during the return to baseline period, controlling for baseline urge to push away, $F(1, 21) = 2.07, p = .17, \eta_p^2 = 0.09$ (see Table 6). For willingness to continue thinking, no significant differences were found during the experimental period, controlling for baseline willingness to continue thinking, $F(1, 19) = 0.69, p = .42, \eta_p^2 = 0.04$ (see Table 6).

**Relations among dependent variables**

To assess Hypothesis 5, Pearson correlation analyses were conducted to assess associations between ratings of thought suppression effort, and each dependent variable
(thought frequency, distress, believability, urge to push away target thoughts, and willingness to continue thinking about target thoughts) during the baseline period across participants (see Table 7). To assess Hypothesis 6, Pearson correlations were also computed to assess associations between level of acceptance, and each dependent variable (thought frequency, distress, believability, urge to push away target thoughts, and willingness to continue thinking about target thoughts) during the baseline period across participants (see Table 7).

Consistent with Hypothesis 5, results showed a positive correlation between efforts to suppress the target thought and urge to push it away, \( r(24) = .54, p < .01 \), indicating the greater the effort to suppress, the greater the desire to push the thought away. There were no significant relationships between effort to suppress and thought frequency counts, subjective thought frequency, distress, believability, and willingness to continue thinking about the target thought. Contrary to Hypothesis 6, there were no significant relationships between the level of acceptance and frequency counts, subjective thought frequency, distress, believability, urge to push away, and willingness to continue thinking about target thoughts.

Exploratory Pearson correlational analyses were conducted to assess associations between ratings of thought frequency, distress, believability, urge to push away, and willingness to continue thinking about the target thought. Results showed a positive correlation between distress and believability, \( r(24) = .72, p < .01 \), indicating that greater distress occurred when the thought was more highly believed, and less distress occurred when the thought was less highly believed (see Table 7). Results also showed a positive correlation between distress and subjective thought frequency, \( r(24) = .73, p < .01 \),
indicating greater distress occurred when the thought occurred more frequently, and less distress occurred when the thought occurred fewer times. Results showed a positive relationship between believability and thought frequency, \( r(24) = .52, p < .01 \), signifying that the higher the believability of the target thought, the greater the number of thought occurrences, and the lower the believability, the fewer thought occurrences. No other relations were significant.

Discussion

The current study evaluated the effects of two emotion regulation strategies, Acceptance and Thought Suppression, on distressing intrusive thoughts (frequency, distress, believability, urge to push thoughts away, and willingness to continue thinking about target thoughts) over three time periods (baseline, experimental, and return to baseline) in a heterogeneous clinical sample of children and adolescents. Participants in the two experimental conditions were expected to demonstrate diverging patterns of event frequency and subjective distress over the experimental and return to baseline phases. Although both conditions showed change in objective and subjective outcomes over the course of the experiment, the expected interactions between condition and experimental manipulation were not found at a statistically significant level. The current study was limited by low power (range = .05 – .91), contributing to the mostly nonsignificant results, but a number of the analyses produced results with effect sizes in the medium to large ranges, suggesting potential for significant findings with larger sample sizes and encouraging further research. Discussion reviews the innovations of the study, potential interpretations given moderate effect sizes, and potential next-steps given its limitations.
Innovations in the current study include the comparison of thought suppression and acceptance in a clinical and elevated symptomatic sample of youth, and the creation of a model for teaching acceptance to clinical youth in a single session that can be used for future treatment development. The current study also simultaneously assessed multiple variables (6) theorized to be influenced by acceptance and thought suppression, a method which can lead to a more comprehensive understanding of how thought suppression and acceptance serve to maintain or diminish youth intrusive thoughts, as opposed to most prior studies that typically assessed only one or two of these variables. The use of subjective ratings of thought frequency as an outcome measure was novel to the study, and provided a new approach for future studies to assess for paradoxical effects of thought suppression.

It was hypothesized that Acceptance would have greater initial increases in thought count frequency, subjective thought frequency, and distress than Thought Suppression (no immediate enhancement effect for thought suppression compared to Acceptance) but would have greater subsequent decreases than Thought Suppression (support for a rebound effect of thought suppression). However, these hypotheses were not fully supported. Instead, Acceptance and Thought Suppression conditions had similar changes in thought frequency (both thought count and subjective ratings) and distress levels across time periods. In both conditions, thought frequency and distress decreased from the baseline to the experimental period (see Tables 2, 3, and 4), and did not change appreciably from the experimental to the return to baseline period (see Figures 2, 3, and 4). It was also hypothesized that Acceptance would have lower believability and urge to push away the target thought and higher willingness to continue thinking about the target
thought than Thought Suppression in the experimental and return to baseline periods. These hypotheses were not confirmed at a statistically significant level. There were no differences in levels of believability, urge to push away, and willingness to continue thinking about the target thought between Acceptance and Thought Suppression in either of the time periods.

Despite the absence of significant results indicating between-condition effects on thought count frequency, subjective thought frequency, and distress described above, an evaluation of effect sizes shows possible trends. From the baseline to experimental periods, there was a medium to large effect for distress between conditions (see Table 4). As demonstrated by Figure 4, Acceptance had larger decreases in distress from the baseline to experimental period than Thought Suppression. No effect was found for thought count frequency or subjective thought frequency during this time period. From the experimental to return to baseline periods, a large effect was found for subjective thought frequency (see Table 3). As demonstrated by Figure 3, Acceptance led to a steady decrease in subjective thought frequency from experimental to return to baseline, while Thought Suppression showed a small increase. No effect was found for thought count frequency or distress during this time period.

For the secondary dependent variables, in the experimental period, no effect was found for believability, urge to push away, and willingness to continue thinking about the target thought between conditions. In the return to baseline period, there was a large effect of urge to push the target thought away between conditions, controlling for the baseline period (see Table 6). As demonstrated by Figure 6, Thought Suppression had a higher urge to push the thought away after suppression than Acceptance. No effect was
found for believability or willingness to continue thinking about the target thought during this time period.

*Thought Frequency*

The lack of significant differences between conditions on thought frequency (by count and subjective ratings) from the baseline to the experimental period could be explained because thought suppression has not been found to be particularly effective in immediately reducing the number of thoughts (Gaskell et al., 2001; Marcks & Woods, 2005; Wegner et al., 1987). In the current study, target thoughts were, in fact, experienced to some degree during thought suppression by Thought Suppression participants (mean number of thought intrusions in Thought Suppression = 7.82; see Table 1), which could have led to similar rates of thought frequency between Thought Suppression and Acceptance. But, additional research is needed for firmer conclusions because prior experiments assessing thought frequency between acceptance and thought suppression are few in number, have inconsistent results, and have not been conducted in youth. One study, similar to our results, found no differences in the number of initial thought intrusions between thought suppression and acceptance in both OCD and non-clinical participants (Najmi et al., 2009), and the other study found acceptance to have more initial thought intrusions than thought suppression in non-clinical participants who had undergone a TAF induction to produce a more OCD-like experience (Marcks & Woods, 2007).

The lack of significant differences in thought frequency between conditions from the experimental to the return to baseline period suggests no rebound effect of thought suppression compared to acceptance in clinical youth. These null findings are consistent
with the main findings of the only prior thought suppression study including children (Gaskell et al., 2001), which may suggest that counterproductive effects are less evident in children and develop only with maturation. But, they are not consistent with that same study’s secondary findings that rebound effects may exist in children with higher state anxiety (Gaskell et al., 2001). The current study’s null findings could suggest that thought frequency is less important in the maintenance of intrusive thoughts than distress or negative appraisals of thoughts (Purdon et al., 2005). But, this is not consistent with the overall experimental literature that demonstrates significant rebound effects of thought suppression (Abramowitz et al., 2000). Furthermore, the results contradict CB theory of OCD, which posits that suppression leads to paradoxical increases in the frequency of obsessions (Rachman, 1997) and exposure leads to improvements in them (Turner, 2006).

If we look at nonsignificant trends based on effect sizes from the experimental to return to baseline period in the current study, we find effects that are more consistent with the literature on thought suppression and OCD. According to nonsignificant trends, there were differential effects on subjective thought frequency between Acceptance and Thought Suppression, with Acceptance participants experiencing a decrease and Thought Suppression participants experiencing an increase. If this effect were to be borne out with larger samples, it could indicate that a rebound effect of thought suppression does occur in clinical children and adolescents compared to acceptance, and that acceptance could be an acceptable and helpful strategy to counteract it. But, cautious interpretation can only be made due to the few, inconsistent experiments comparing thought suppression and acceptance, none of which has included youth. In Marcks and Woods (2007)’s non-clinical study of thought suppression and acceptance, there were greater decreases in
thought frequency after acceptance than thought suppression. This is a pattern that is consistent with our nonsignificant trend, and indicates a poorer ability to subsequently downregulate thought intrusions in thought suppression than acceptance. However, Najmi et al. (2009)’s experimental study comparing thought suppression with alternate conditions showed no subsequent differences in thought frequency between acceptance and thought suppression, indicating no rebound effect.

According to nonsignificant trends, Acceptance resulted in a greater decrease in subjective thought frequency than Thought Suppression (which produced a minimal increase) from the experimental to return to baseline periods, but there were no between-condition differences for thought count frequency. This suggests that the actual number of thoughts did not decrease more in Acceptance, but that there was just a perception that they were decreasing more compared to Thought Suppression (which had a slight increase in frequency perception). This finding is consistent with the theory that thought suppression may not maintain obsessions by increasing actual thought frequency, but instead by increasing sensitivity to and detrimental perceptions of unwanted thoughts, such as that they need to be controlled and that it is catastrophic if they are not (Purdon et al., 2005). Accordingly, after suppression, more catastrophizing about thought intrusions may have led to greater time spent dwelling on their re-occurrence, and higher subjective estimates of thought frequency.

Since acceptance discourages the avoidance or control of thoughts, it may oppose the aforementioned cycle, producing less sensitivity and catastrophizing about the number of thoughts experienced, and result in a lower perception of the number of unwanted thoughts. In sum, the subjective experience about number of thoughts, rather
than the actual number of them, may be a more important contributor to the cycle of obsessions. It is unclear whether this is the case, though, because prior studies comparing acceptance and thought suppression have only used actual counts rather than subjective measures to rate thought frequency (Marcks & Woods, 2007; Najmi et al., 2009). The inclusion of subjective appraisal of thought frequency, in addition to actual counts, is recommended in future studies to further explore this theory.

Distress

The lack of statistically significant differences in distress between conditions indicates that acceptance and thought suppression had equivalent effects on distress across time periods. One explanation for the lack of distress differences between conditions is that thought frequency (by count and subjective ratings) was similar between Acceptance and Thought Suppression across time periods. It would not necessarily be expected for distress about thoughts to be different between conditions if the number of distressing thoughts was similar. Distress and frequency of unwanted intrusive thoughts have been positively correlated in clinical OCD (Foa, Kozak, Salvoskis, Coles & Amir, 1998) and in non-clinical samples (Salkovskis & Harrison, 1984).

The lack of significant differences between conditions may suggest that acceptance in youth does not produce beneficial relative effects on distress compared to thought suppression. In their study of TAU versus TAU plus ACT in schizophrenic patients, Bach and Hayes (2002) found that participants in the condition that received acceptance (TAU plus ACT) did not differ from the other condition (TAU) in distress about thoughts, but differed in the believability of thoughts, and had fewer re-
hospitalizations. Thus, despite the null distress differences in the current study, acceptance could have still had a positive impact on intrusive thoughts through an impact on another important variable (e.g., perceptions of thoughts, urges to act in response to thoughts). On the other hand, the null findings are not consistent with evidence from preliminary acceptance treatment studies of adults with OCD (Twohig et al., 2006) suggesting acceptance leads to reductions in anxiety.

The lack of significant differences between conditions in distress could also suggest that thought suppression in youth does not contribute to intrusive thoughts by increasing distress, as has been theorized in the adult OCD literature (Purdon et al., 2005). But, this is not consistent with broad-based evidence from the childhood OCD treatment literature (King et al., 1998) and the youth coping literature (Compas et al., 2001) that indicates thought suppression maintains distress about thoughts.

Caution should be used in interpreting the null distress findings because of the aforementioned contradictory evidence, but also because of the limited, conflicting findings in the only three prior experimental studies comparing acceptance and thought suppression. One experiment, consistent with our results, showed no differences in distress between thought suppression and acceptance (Marcks & Woods, 2007), but two other experiments showed that there were decreases in distress in acceptance while there were increases in thought suppression after the experimental period (Marcks & Woods, 2005; Najmi et al., 2009). Additional experimental research of acceptance and thought suppression with youth participants is necessary to determine the existence of between-condition distress effects, and their potential role in youth intrusive thoughts.
Despite null findings at a statistically significant level, according to nonsignificant trends based on effect sizes, Acceptance produced greater decreases in distress than Thought Suppression from the baseline to the experimental period. Caution should be used in interpreting the trend since only one study of acceptance and thought suppression has assessed distress during the experimental period and it produced nonsignificant between-condition findings (Najmi et al., 2009). But, if this finding were to be borne out with larger samples, it could suggest that acceptance is more immediately helpful to distress than thought suppression. Possible explanations of how Acceptance may have produced greater immediate reductions in distress compared to Thought Suppression (according to nonsignificant trends) are as follows: Firstly, by accepting, and not suppressing thoughts, there was likely no immediate expectation that thoughts would decline. As such, acceptance may have produced less catastrophizing about the meaning of the failure to control thoughts and less dismay and distress when thoughts inevitably recurred (Purdon et al., 2005). Secondly, and simultaneously, acceptance could have begun generating less distressing thought appraisals during the experimental period such as that thoughts are not important, but are just passing internal events (Hayes et al., 1999). Although these explanations are in line with CB theory of OCD (Salvoskis, 1996), and acceptance/mindfulness theories about changing one’s perspective on thoughts (Hayes et al., 1996), the current study does not directly assess change in relevant thought appraisals (e.g., “It is important and necessary to control thoughts”) that, if related in expected directions with experimental conditions, would corroborate the explanations more fully. So, it is recommended that future experiments of acceptance and thought suppression include thought appraisal assessments.
Thirdly, greater exposure and emotional processing of target thoughts in Acceptance may also explain the larger reductions in distress in Acceptance than Thought Suppression that occurred according to nonsignificant trends. However, the distress reductions would not have been expected to occur immediately, but rather during a subsequent time period after sufficient exposure and habituation had occurred (Foa & Kozak, 1986). It is possible that distress peaked and habituated earlier than expected during the experimental period in Acceptance, causing the earlier reductions. But, in order to determine whether this occurred, repetitive distress assessments throughout the experimental period would be necessary.

**Secondary Outcomes**

None of the secondary outcome variables (believability, urge to push away, willingness to continue thinking about the target thought) differed between conditions at a statistically significant level, suggesting acceptance and thought suppression may not have differential effects on them, and may not contribute to youth intrusive thoughts. However, in the one prior experimental study comparing acceptance and thought suppression that evaluated these three variables, Marcks and Woods (2007) found that acceptance participants had greater willingness to re-experience the target thought than thought suppression participants after the experimental tasks. Also, positive associations have been identified between initial thought suppression effort and urge to neutralize (similar to urge to push away), as well as likelihood ratings (similar to believability) of target thoughts (Marcks & Woods, 2005, 2007). Thus, despite null results in the current study, prior (albeit limited) research with adult participants suggests that there may, in fact, be differential effects on the secondary variables. Additional research with youth
participants is necessary to understand if and how these variables are impacted by acceptance and thought suppression, and how they may contribute to youth intrusive thoughts.

Additional support for this idea comes from a nonsignificant trend based on effect sizes in the current study, which was: After suppressing thoughts, Thought Suppression participants had greater urges to suppress than Acceptance participants as hypothesized. This trend supports differential effects of acceptance and thought suppression, and is consistent with the idea that failures in thought suppression may lead to more suppression attempts, thus maintaining the negative cycle of obsessions (Marcks & Woods, 2007; Purdon et al., 2005). It is also consistent with the idea that acceptance may be able to reduce the impact of unwanted thoughts (Hayes et al., 1999; Wicksell et al., 2007), and could be a useful alternate approach to suppression (Orsillo et al., 2005).

**Correlation Analysis**

Among all participants during the baseline period, suppression effort and level of acceptance did not have significant relationships with most dependent variables. But, as hypothesized, there was a positive relationship between baseline suppression effort and baseline urge to push away the target thought. Although this relationship is correlational and therefore not causal, it may indicate the possible importance of decreasing the urge to suppress in ultimately reducing thought suppression (and its counterproductive effects). The correlation may also suggest the possible importance of acceptance, with its emphasis on decreasing experiential avoidance, in reducing urges to suppress and suppression attempts (Hayes et al., 1999).
Among all participants during the baseline period, there were also significant associations between believability and distress, between believability and subjective thought frequency, and between distress and subjective thought frequency. Caution should be used when interpreting the significance of these latter associations, since no relationships were hypothesized a priori. But, though these associations are not causal, they are consistent with the theory that dysfunctional beliefs about thoughts, such as the belief that thoughts are important and true (OCCWG, 1997), are related to the level of distress about them and how frequently they intrude (Rassin et al., 2000). The correlational results suggest the possible importance of acceptance techniques in initially reducing believability of thoughts, and ultimately reducing distress and thought frequency.

Methodological Issues

This section will discuss possible methodological reasons why the study hypotheses were not confirmed. Firstly, as mentioned above, low power may have contributed to nonsignificant results. Secondly, a possible habituation effect to the target thought, demonstrated through large across-condition decreases in thought frequency (by count and subjective ratings) and distress from baseline to the experimental period may have countered paradoxical effects, and contributed to the lack of statistically significant between-condition differences. Although our study design comprised of elements to work against habituation over time (e.g., priming tasks), these procedures may need to be intensified in future studies.

Thirdly, the main experimental manipulation was only partially effective. As predicted, Acceptance and Thought Suppression participants reported similar rates of
following experimental instructions and Acceptance participants reported a significantly higher degree of “letting the thought be there without pushing it away” than Thought Suppression participants. However, Acceptance and Thought Suppression participants did not differ in the degree they reported “trying to push the thought out of their mind,” indicating both conditions engaged in thought suppression. In response to open-ended questions about what participants did with their thoughts during the experimental period (see Table 8), five out of thirteen Acceptance participants reported using thought suppression strategies rather than acceptance strategies (see Table 8). These five Acceptance participants used language to describe their strategy such as, “get it out,” “push it in the bubble,” “shove it into the bubble,” and “popped the bubble,” suggesting that they were treating the bubble exercise inaccurately as a method of suppressing rather than accepting thoughts. On the other hand, when Thought Suppression participants were asked similar open-ended questions, all 11 participants responded that they utilized appropriate thought suppression strategies (see Table 8). If Acceptance participants were using suppression techniques, it is not surprising that factors hypothesized to be differentially affected by Acceptance and Thought Suppression did not have the predicted outcomes.

To make it more likely that youth in the Acceptance condition use acceptance over suppression in future studies, it would be useful to clarify the Acceptance instructions. For example, the Acceptance script should repetitively explain that putting the thoughts in bubbles is not meant to push the thoughts away or remove them. Props or drawings of the cognitive technique the child is supposed to be utilizing, in addition to the verbal instructions, may help the child learn and implement the strategy better.
Additionally, since individuals with OCD, which made up half of the study sample, have a natural active resistance to obsessions (Purdon & Clark, 2001), the use of obsessions as target thoughts may have also contributed to suppression in the Acceptance condition, and future studies may choose to use neutral thoughts as targets.

Fourthly, Acceptance participants may not have been given sufficient time to practice and learn their technique, which was more cognitively demanding than Thought Suppression’s technique. When asked open-ended questions, four out of 13 Acceptance participants named barriers to following instructions that might have been improved through additional practice of the technique (see Table 9) such as forgetting to implement it (n=3), and thoughts going faster than participants could put them in the bubbles (n=1). Only one of the eleven Thought Suppression participants named a barrier that might have been improved through additional practice (forgetting), suggesting that Thought Suppression for most participants was an easier strategy to apply and remember with one brief session. The addition of more practice of the acceptance technique could improve its implementation and the prospects of detecting between-condition differences.

Fifth, comprehension difficulties may have prevented valid between-condition comparisons of two secondary variables. Several participants asked for clarification about two SUO items (willingness to continue thinking, believability of the target thought), and two participants did not answer one SUO item (willingness to continue thinking) due to lack of understanding. To accurately capture how these secondary variables are impacted by Acceptance and Thought Suppression in youth, it is recommended to utilize clearer and more child-friendly language.
Sixth, heterogeneity of the study sample may have contributed to the absence of counterproductive effects of thought suppression compared to acceptance at a statistically significant level. Prior research suggests that the negative effects of thought suppression may be more potent in individuals with OCD than in those with non-OCD anxiety or non-clinical individuals (Janeck & Calamari, 1991; Najmi et al., 2009; Tolin et al., 2001). Only 50.0% of the current study’s participants were diagnosed with OCD. Thus, it is recommended that future studies exclusively target youth with OCD in order to optimize detection of counterproductive effects of thought suppression in youth.

Finally, the use of event marking as the procedure for assessing thought count frequency may have prevented the detection of paradoxical effects of thought suppression in the study. Event marking was selected due to the young age of participants and their potential difficulties in implementing the more cognitively challenging alternative method, verbalization of thoughts, but event marking has not been as highly associated with paradoxical effects. Verbalization of thoughts may be indicated with adolescent participants for whom it would be comprehensible in future studies.

Limitations

The study was limited by the lack of a monitor-only control condition. We decided not to add in this third study condition because of the increased sample size that it would require, and the difficulties and time constraints associated with recruiting a clinical sample for the study. But, without this type of control to compare the experimental conditions, it is unknown whether the results that the experimental conditions displayed were better than, worse than, or the same as the effects of not using a coping strategy at all. Future studies of this type should include a monitor-only control
condition (e.g., baseline instructions to count target thoughts through all three study periods). The study was additionally limited by the CBT psychotherapy status of participants as many participants were either in the midst of CBT or had completed a full CBT course. Future experiments should be conducted before the initiation of psychotherapy to prevent confounding effects of prior exposure to study principles and tasks.

This preliminary experiment provides initial evidence about the counterproductive cycle of thought suppression in clinical youth, and the beneficial comparative impact of acceptance strategies on important outcomes such as distress, perceptions of numbers of thoughts, and suppression urges. Although hypotheses weren’t routinely supported, if trends continue with larger samples, thought suppression could be identified as an important contributor to youth intrusive thoughts, and acceptance could be identified as a helpful alternative coping strategy.
References


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Note. Accept= Acceptance, TS= Thought Suppression.
Table 2
Mixed Analysis of Variance: Time Period vs Condition for Thought Count Frequency

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<tr>
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<td>0.92</td>
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Repeated Contrasts

<table>
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Note: Condition = Acceptance, Thought Suppression; Time= Time Period (B=baseline, E= experimental, R=return to baseline).
* = Significant at p < .05; ** = Significant at p < .01.
Table 3
Mixed Analysis of Variance: Time Period vs Condition for Subjective Thought Frequency

<table>
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Repeated Contrasts

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<th>df</th>
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Note: Condition = Acceptance, Thought Suppression; Time = Time Period (B=baseline, E= experimental, R=return to baseline).
* = Significant at p < .05.
Table 4
Mixed Analysis of Variance: Time Period vs Condition for Subjective Units of Distress (SUDS)

<table>
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<td>1.38</td>
<td>2, 44</td>
<td>0.26</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Repeated Contrasts

<table>
<thead>
<tr>
<th>Measure</th>
<th>F</th>
<th>df</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time: B vs E</td>
<td>7.84</td>
<td>1, 22</td>
<td>0.01*</td>
<td>0.26</td>
</tr>
<tr>
<td>Time: E vs RB</td>
<td>0.51</td>
<td>1, 22</td>
<td>0.48</td>
<td>0.02</td>
</tr>
<tr>
<td>Time x Condition: B vs E</td>
<td>1.67</td>
<td>1, 22</td>
<td>0.21</td>
<td>0.07</td>
</tr>
<tr>
<td>Time x Condition: E vs R</td>
<td>0.04</td>
<td>1, 22</td>
<td>0.85</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Note: Condition = Acceptance, Thought Suppression; Time= Time Period (B=baseline, E= experimental, R=return to baseline).

* = Significant at p < .05; ** = Significant at p < .01.
Table 5
Analyses of Covariance Comparing Acceptance and Thought Suppression conditions at the Experimental Period Controlling for Baseline Measurement.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>F</td>
</tr>
<tr>
<td>Baseline Accept</td>
<td>45.62</td>
<td>35.68</td>
<td>54.27</td>
<td>36.14</td>
<td>41.62</td>
<td>33.28</td>
<td>49.45</td>
<td>40.76</td>
<td>0.001</td>
</tr>
<tr>
<td>Baseline TS</td>
<td>62.54</td>
<td>38.32</td>
<td>83.82</td>
<td>30.34</td>
<td>67.15</td>
<td>38.22</td>
<td>85.82</td>
<td>18.96</td>
<td>0.64</td>
</tr>
<tr>
<td>Experimental Accept</td>
<td>59.15</td>
<td>38.67</td>
<td>34.00</td>
<td>39.32</td>
<td>55.69</td>
<td>36.43</td>
<td>29.45</td>
<td>37.00</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Note: Accept= Acceptance, TS= Thought Suppression.
### Table 6
Analyses of Covariance Comparing Acceptance and Thought Suppression conditions at the Return to Baseline Period Controlling for Baseline Measurement.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline</th>
<th></th>
<th></th>
<th></th>
<th>Return to Baseline</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accept</td>
<td>TS</td>
<td>Accept</td>
<td>TS</td>
<td>F</td>
<td>df</td>
<td>p</td>
<td>η²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=13)</td>
<td>(n=11)</td>
<td>(n=13)</td>
<td>(n=11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Believability</td>
<td>45.62</td>
<td>35.68</td>
<td>54.27</td>
<td>36.14</td>
<td>36.92</td>
<td>34.85</td>
<td>53.00</td>
<td>41.13</td>
<td>1.08</td>
<td>1, 21</td>
<td>0.31</td>
</tr>
<tr>
<td>Urge to push away</td>
<td>67.15</td>
<td>38.22</td>
<td>85.82</td>
<td>18.96</td>
<td>51.31</td>
<td>40.51</td>
<td>80.27</td>
<td>23.83</td>
<td>2.07</td>
<td>1, 21</td>
<td>0.17</td>
</tr>
<tr>
<td>Willingness</td>
<td>59.15</td>
<td>38.67</td>
<td>34.00</td>
<td>39.32</td>
<td>48.77</td>
<td>42.72</td>
<td>24.45</td>
<td>32.30</td>
<td>0.69</td>
<td>1, 19</td>
<td>0.42</td>
</tr>
</tbody>
</table>

*Note.* Accept= Acceptance, TS= Thought Suppression
Table 7. Relationships among Suppression Effort, Level of Acceptance, and Dependent Variables during the Baseline Period.

<table>
<thead>
<tr>
<th></th>
<th>Suppression Effort</th>
<th>Level of Acceptance</th>
<th>Distress</th>
<th>Believe</th>
<th>Urge</th>
<th>Willing</th>
<th>Subj Freq</th>
<th>Thought Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppression Effort</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of Acceptance</td>
<td>-.44</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>-.09</td>
<td>-.02</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Believe</td>
<td>-.22</td>
<td>.03</td>
<td>.72**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urge</td>
<td>.54**</td>
<td>-.24</td>
<td>-.07</td>
<td>-.01</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willing</td>
<td>-.15</td>
<td>.18</td>
<td>.17</td>
<td>.10</td>
<td>-.30</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subj Freq</td>
<td>-.16</td>
<td>.19</td>
<td>.73**</td>
<td>.52**</td>
<td>-.07</td>
<td>.23</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Thought Count</td>
<td>.25</td>
<td>-.23</td>
<td>.19</td>
<td>.07</td>
<td>.27</td>
<td>.17</td>
<td>.30</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. *= Correlation is significant at the .05 level (1-tailed). **= Correlation is significant at the .01 level (1-tailed).
<table>
<thead>
<tr>
<th>What Participant Did</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acceptance</strong></td>
<td></td>
</tr>
<tr>
<td>1. Click 1, Tried to get it out of mind</td>
<td>Suppression</td>
</tr>
<tr>
<td>2. Let it go, Put in bubble</td>
<td>Acceptance</td>
</tr>
<tr>
<td>3. Thought about it, Let it go, At least it is out of my mind and in front of me</td>
<td>Acceptance</td>
</tr>
<tr>
<td>4. Push it push it push it into bubble</td>
<td>Suppression</td>
</tr>
<tr>
<td>5. Put in bubble, Let it be there, Thought started to leave</td>
<td>Acceptance</td>
</tr>
<tr>
<td>6. No, I don’t know</td>
<td>Unknown</td>
</tr>
<tr>
<td>7. Shoved it in a bubble</td>
<td>Suppression</td>
</tr>
<tr>
<td>8. I tried to put it away</td>
<td>Suppression</td>
</tr>
<tr>
<td>9. Put it in bubble and wait</td>
<td>Acceptance</td>
</tr>
<tr>
<td>10. Put in bubble</td>
<td>Acceptance</td>
</tr>
<tr>
<td>11. Pressed one and enter, and waited for thought to float away in bubble</td>
<td>Acceptance</td>
</tr>
<tr>
<td>12. Put one down, tried to think of other thoughts</td>
<td>Suppression</td>
</tr>
<tr>
<td>13. Pressed one and enter</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Thought Suppression</strong></td>
<td></td>
</tr>
<tr>
<td>1. Tried to get rid of them</td>
<td>Suppression</td>
</tr>
<tr>
<td>2. Poof</td>
<td>Suppression</td>
</tr>
<tr>
<td>3. Did not think about it</td>
<td>Suppression</td>
</tr>
<tr>
<td>4. Pushed something in front of it</td>
<td>Suppression</td>
</tr>
<tr>
<td>5. Poof and went back to thinking</td>
<td>Suppression</td>
</tr>
<tr>
<td>6. Did poof, pressed key</td>
<td>Suppression</td>
</tr>
<tr>
<td>7. Tried to think of purple elephant instead</td>
<td>Suppression</td>
</tr>
<tr>
<td>8. Pressed 1 and enter key and tried to push it out of head</td>
<td>Suppression</td>
</tr>
<tr>
<td>9. Said something in my mind to make it go away and disappear</td>
<td>Suppression</td>
</tr>
<tr>
<td>10. Press key, spin ring</td>
<td>Suppression</td>
</tr>
<tr>
<td>11. Didn’t think about it</td>
<td>Suppression</td>
</tr>
</tbody>
</table>
Table 9  
Barriers to Following Instructions

<table>
<thead>
<tr>
<th>Acceptance</th>
<th>Thought Suppression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thought bothered too much to put in bubble</td>
<td>1. Always tried but didn’t do it perfectly</td>
</tr>
<tr>
<td>2. Unknown</td>
<td>2. Thought popped up</td>
</tr>
<tr>
<td>3. Unknown</td>
<td>3. Nothing</td>
</tr>
<tr>
<td>4. Thought faster than could put thoughts in bubble</td>
<td>4. Unknown</td>
</tr>
<tr>
<td>5. Nothing</td>
<td>5. Worrying</td>
</tr>
<tr>
<td>7. Unknown</td>
<td>7. Thought about the target thought</td>
</tr>
<tr>
<td>9. Thinking about other stuff /Forgot</td>
<td>9. Forgot I was supposed to</td>
</tr>
<tr>
<td>10. Forgot</td>
<td>10. Nothing</td>
</tr>
<tr>
<td>12. Sometimes forgot</td>
<td></td>
</tr>
<tr>
<td>13. Nothing</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1. Experimental timeline.
Figure 2. Mean target thoughts counted by Acceptance (n=13) and Thought Suppression (n=11) conditions over three time periods.
Figure 3. Mean subjective thought frequency in Acceptance (n=13) and Thought Suppression (n=11) conditions across three time periods.
Figure 4. Subjective units of distress (SUDS) about target thought in Acceptance (n=13) and Thought Suppression (n=11) conditions over three time periods.
Figure 5. Mean believability of target thought in Acceptance (n=13) and Thought Suppression (n=11) conditions across three time periods.
Figure 6. Mean urge to push target thought away in Acceptance (n=13) and Thought Suppression (n=11) conditions across three time periods.
Figure 7. Mean willingness to continue thinking about target thought in Acceptance (n=13) and Thought Suppression (n=9) conditions across three time periods.
Appendix A

Scripts of Experimental Conditions

Acceptance Script:

Avoiding [or pushing away] thoughts you don’t like can make them come back more later on. Since it doesn’t help to push your thoughts away, over the next 4 minutes, I want you to do what we call, accepting your thoughts. Do you know what it means to accept your thoughts? It means that it is ok to have a thought there and not feel like you have to push it away. Even when a thought is scary or uncomfortable, that doesn’t mean the thought is real or true. Thoughts are just thoughts that don’t really mean anything. For example, if I have the thought, I am purple, that doesn’t mean that I am purple. It means I had a thought that I was purple. Thoughts are just things that pass through your mind that aren’t necessarily real or true. So, it can sometimes be okay to let the thought just sit there and for you to be okay with it, even if it is a scary thought.

Sitting there with the thought over time makes the thought lose its power. But how do you do this – accepting your thoughts? Let’s try this exercise. I would like you to try to imagine that there is a long line of bubbles floating by you, moving from right to left on a long line as far as you can see. Bubbles come in from the right [slow speaking pace] to the left, floating gently along, moving to your left until it disappears out of sight. Some bubbles may go slow and some bubbles might go fast. What’s neat about these bubbles is that you can put any thought that comes into your head in each bubble, and the thought can ride in the bubble. Each thought that comes into your head can just be placed gently into a bubble and you can watch it float from right to left… slowly out of sight.
So, I could have the thought, I wonder if s/he [the child] understands me? and put it in a bubble and watch it float from right to left slowly, until it disappears out of sight.

Sometimes the thought that I put in the bubble will come back, and that’s ok. I just place the thought in a bubble once again and let it float by. The key thing is that I don’t want to chase after the thought or run away from the thought. I also don’t want to try and blow the bubble or pop the bubble. Sometimes a scary thought will make you do that. But I just want to notice that I’ve put my thought in the bubble and let it float away.

So, over the next 4 minutes, I’d like you to notice your thoughts as they come into your head, including the target thought, and as they come into your head, I want you to put the thoughts into a bubble and let them float. Does that make sense? At the same time, if you DO think about the target thought, place it in a bubble, but also press this key each time that it comes into your head, just like the first time. Got it? Notice the target thought, press the button, and put it in a bubble and watch it float. Continue in this same way for the full 4 minutes.

Ok, Do you understand? What are you going to do for the next 4 minutes? That’s right (or No, that’s not quite right). You will be thinking about whatever you want including your target thought. Each thought that you have, including the target thought, you will place it in a bubble and let it float by without blowing the bubble away or popping it. You will also press this key each time you think about your target thought.

Thought Suppression Script:

Sometimes when you get a thought you don’t like, it helps to push that thought away. Thinking about things that make you nervous or scared can get you riled up or
upset, so there’s no point in thinking about them, right? So, one thing people do is they try not to think about scary thoughts, or when they notice a scary thought, they close their eyes and they try to make that thought disappear! They get a picture of the thought in their head and they just think, Poof! and watch the thought disappear. Trying not to think about thoughts or pushing them away like this can help make those thoughts go away for a short while and give you a break from them.

Let’s try an exercise! I would like you to keep track of the thoughts that come into your head – just like you did the first time – but this time, I’d like you to try not to think about that target thought. But, when that target thought pops into your head, I’d like you to try as hard as you can to think, Poof! and make it disappear, or do something else that helps you to not think about the thought. Is there something you do that helps you to not think about certain thoughts? If the thought comes back again, immediately just think, Pop! and make it vanish again. The key thing is that those thoughts can be tricky things and they’ll want to come back over and over, so any time they come back, you have to quickly take them and go Poof! to make them disappear. It’s the best way to push those scary thoughts out of your mind. Does that make sense?

So, over the next 4 minutes, I’d like you to try not to think about that target thought. If that thought comes into your head, I want you to press this key – just like the first time, and then make it go Poof as quickly as you can either by using the Poof exercise or by using another way to get rid of the thought that works better for you. Got it? Try not to think the thought, but if you do, press the button, and then make it go Poof! as quickly as you can.
Ok, Do you understand? What are you going to do for the next 4 minutes? That’s right (or No, that’s not quite right). You will be trying not to think about your target thought. If you have your target thought, you will press this key and try to make it go Poof as quickly as you can.
Curriculum Vitae

Tara Lynn Harrison

EDUCATION

June 2000  PRINCETON UNIVERSITY, Princeton, NJ
Bachelor of Arts, Psychology

October 2007  RUTGERS, The State University of New Jersey, Piscataway, NJ
M.S., Clinical Psychology

January 2011  RUTGERS, The State University of New Jersey, Piscataway, NJ
Ph.D., Clinical Psychology

WORK EXPERIENCE

2000 – 2002  NIH Post-Baccalaureate IRTA Fellow
Pediatrics and Developmental Neuropsychiatry Branch
National Institute of Mental Health, NIH
Bethesda, MD

2002 – 2003  Teacher/Teacher Assistant
Oakmont School, Gaithersburg, MD

2003 – 2004  Research Associate
Danya International, Silver Spring, MD

2004 – 2005  Research Associate
Center for Naval Analysis, Alexandria, VA

PUBLICATIONS
