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Development and validation of the Adolescent Thought Control Questionnaire (TCQ-A)

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DEVELOPMENT AND VALIDATION OF THE ADOLESCENT THOUGHT CONTROL
QUESTIONNAIRE (TCQ-A)

A Thesis
Submitted to the Graduate Faculty of the
Louisiana State University
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Arts

In

The Department of Psychology

By
Reanna (Sara) Elise Whiting
B.A., Smith College, 2006
May 2012

DEDICATION

For my parents, Dennis Case, Debra Case, and Janet Whiting, and my grandparents, Willa Case, Roger Case Sr., and Heidi Case. Thank you for your immeasurable support, quiet guidance, selfless generosity, encouraging humor, and for your unique brand of free-range parenting that has inspired me to pursue a life of independent exploration and curiosity. You have been instrumental in making my academic career thus far possible.

Also, for the friends and family who have kept me grounded and have made me laugh throughout the writing of this document. Thank you Tracy Lee-Pidgeon, Philip Case, Shelley Case, Roger Case Jr., Sandra Case, Kristin Fitch, Kolette Ring, Sara Barz, Anna May, Ziggy Stardust-Case, and Mr. Mittens Fluffypants-Whiting.

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ABSTRACT

Despite receiving widespread attention in the adult literature, virtually no information about the effects of thought suppression currently exists using a developmental psychopathology perspective in adolescents. The current study describes the development and preliminary validation of The Adolescent Thought Control Questionnaire, a self-report measure of thought suppression strategy use among adolescents. A principal factor analysis revealed an identical factor structure to the adult Thought Control Questionnaire (Wells & Davies, 1994) and included subscales measuring Distraction, Reappraisal, Social, Worry, and Punishment strategies. Adequate evidence of internal and test-retest reliability was obtained. The TCQ-A evidenced strong validity when tested for relations to measures of internalizing symptoms among adults. Implications for models of adolescent psychopathology as well as assessment and treatment are discussed.

CHAPTER 1. INTRODUCTION

Intrusive thoughts are unwanted, persistent, and often distressing psychological occurrences that take the form of verbal thoughts, mental images, and/or recurrent memories. While such thoughts are most closely associated with emotional disorders such as obsessive-compulsive disorder, generalized anxiety disorder, and post-traumatic stress disorder, most individuals, even those without psychopathology, experience these intrusive thoughts (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). Early investigations into the methods for controlling intrusive thoughts have focused exclusively on adults engaging in thought suppression, an active attempt to avoid thinking of the unwanted thought. Wegner, Schneider, Carter and White (1987) were the first to examine thought suppression experimentally by randomly placing participants into one of two conditions that either instructed them to “not think of a white bear” (suppression) or to “think of a white bear” (expression) for a fixed period of time. Half of the sample performed suppression first, followed by the expression task. The remaining half performed the expression task before suppression. The results showed a significant increase in the number of target thoughts during the expression task if it was preceded by a period of suppression as compared to the number reported by participants who did not first engage in suppression. Wegner and colleagues theorized that this “rebound effect,” or increased frequency of target thoughts after ending engaging in thought suppression, could be due to the underlying strategies of thought control, namely distraction by replacing the target thought with another innocuous thought. The authors posited that the more a participant replaced the target thought with a distractor thought, the more the distractor and target became associated, thus further triggering target thoughts.

From Wegner's seminal study, numerous other investigations have sought to further understand the effects of thought suppression in both non-clinical and clinical populations. Through greater understanding of these effects, thought suppression has been incorporated into several cognitive and cognitive-behavioral models of psychopathology. To aid clinicians and researchers in quickly assessing thought suppression, self-report measures have been developed in addition to experimental paradigms. With a single exception, thought suppression experiments and assessments have only been developed for use with adult samples. Using the knowledge gained from the adult literature, the current proposal aims to develop a self-report assessment of thought suppression for adolescents.

1.1 Experimental Effects Of Thought Suppression

While Wegner et al. (1987) was the first to investigate the effects of thought control, many researchers questioned the methodology. Principally, the expression task drew criticism for introducing thought reporting practice effects. Likewise, it was believed that the expression task may have produced a ceiling effect for the control condition, potentially washing out any immediate increase in the frequency of the target thought during the suppression period compared to the initial expression control period (i.e., "immediate enhancement effect"). Subsequent investigations of thought suppression have, therefore, removed the expression task and have added a control task in which the group received instructions to report any thoughts including the target thought. In this way, the mere mention of the target thought in the suppression condition instructions may be controlled. Despite altering the original paradigm to address methodological concerns, Clark, Ball, and Pape (1991) found no evidence of the immediate enhancement effect. Nevertheless, the authors noted that the suppression group

demonstrated a significantly greater number of target thoughts during the free-reporting phase as compared to control groups, thus replicating the rebound effect.

Similarly, Clark, Winton, and Thynn (1993) aimed to compare instructional methods by modifying Clark et al.'s (1991) original paradigm to include three conditions: unrestricted suppression, mention-control, and suppression without distraction. The suppression without distraction group was instructed to perform thought suppression without engaging in distraction techniques, thus testing Wegner et al.'s (1987) hypothesis that use of distraction may cause the rebound effect due to forming associations with distractor thoughts. Consistent with the Clark et al. (1991) results, but inconsistent with Wegner et al.'s (1987) distraction hypothesis, the rebound effect was seen in both suppression conditions. No evidence of an immediate enhancement effect was shown in the results suggesting that the rebound effect is a consequence of engagement in thought suppression.

While, several studies have supported the existence of a rebound effect and have failed to find evidence of an initial enhancement effect, still others have found the opposite. Two studies using mention-control groups, one of which also used a suppression-without-distraction group, found a significant increase in target thought occurrences during suppression periods as compared to controls who did not suppress. While an immediate enhancement effect was noted, no rebound effects were found (Lavy & van den Hout, 1990; Merchelbach, Muris, van den Hout, & de Jong, 1991). Several methodological differences exist between experimental paradigms of thought suppression, namely the method of thought reporting (verbal reporting vs. numerical frequency tallies), which may have accounted for inconsistent findings of both the rebound and initial enhancement effects.

One of the major criticisms of early experimental thought suppression designs has been the use of emotionally neutral target thoughts. Salkovskis and Campbell (1994) argued that previous methodologies lacked ecological validity and therefore the suppression process measured may qualitatively differ from self-initiated suppression outside of the laboratory. The overwhelming majority of unwanted thoughts experienced in non-clinical samples are negatively valenced (Rachman & de Silva, 1978), unlike the neutral and often uncommon target thoughts used in the aforementioned studies. As such, Salkovskis and Campbell designed an experiment using negatively valenced and personally relevant target thoughts. Participants were randomly assigned to one of five conditions: unrestricted suppression, mention-control, suppression using distraction, suppression without using distraction, and suppression with a distracting cognitive task. After completing one condition, all participants then engaged in an unrestricted thought reporting period. Globally, the results revealed evidence in support of the immediate enhancement effect. However, the study failed to support the previously found rebound effect. Interestingly, a comparison of the distraction conditions revealed that thought suppression that purposely used distraction demonstrated the immediate enhancement effect; however, neither a specific distraction task nor engaging in suppression without using distraction demonstrated the initial enhancement effect, which is in direct contrast to demonstrations of the initial enhancement effect during instructions not to engage in distraction (Lavy & van den Hout, 1990).

To further address the problem of ecological validity, Trinder and Salkovskis (1994) designed an experiment in which participants recorded the frequency of a personally relevant and negatively valenced intrusive thought over the course of four days. Unlike previous designs, which took place over the course of minutes in a laboratory, Trinder and Salkovskis extended the

experimental window to approximate daily instances of thought suppression. Participants were assigned to one of three groups: suppression, mention-control, and a condition in which participants were instructed to think about the thought for as long as possible whenever the thought naturally occurred. Overall, the thought suppression group demonstrated greater frequency of thought intrusion as compared to the mention-control and think-through groups, which is indicative of the immediate enhancement effect. Due to the methodological limitations of the study, the rebound effect could not be examined. As the authors note, the finding that the think-through group did not significantly differ from the control group but was significantly different than the suppression group suggests that the enhancement effect is a direct result of active suppression rather than time spent consciously monitoring for the thought. While Salkovskis and Campbell (1994) and Trinder and Salkovskis (1994) have demonstrated the immediate enhancement effect using negatively valenced, personally relevant target thoughts, there have been similar studies that have failed to find any significant effects of thought suppression (Muris, Merchelbeck, van den Hout, and de Jong, 1992; Roemer and Borkovec, 1994).

Among non-clinical adult samples, emotionally neutral target thoughts have produced mixed findings with some studies supporting the immediate enhancement effect but not the rebound effect and others finding the opposite. Studies using emotionally valenced and personally relevant target thoughts have likewise produced inconsistent results. A meta-analysis of published experimental investigations revealed a significant rebound effect; however, there was little evidence to support the initial enhancement effect (Abramowitz, Tolin, & Street, 2001) regardless of the emotional valence of the target thought. Clearly, there is a lack of consensus across the experimental studies of thought suppression; nevertheless, the literature is suggestive

that thought suppression may have bimodal effects on the frequency of intrusive thoughts among adults.

While there are numerous studies examining thought suppression effects in adults, a dearth of such investigations exist using youth populations. To date, only one peer-reviewed study has experimentally examined thought suppression in a sample of children. Gaskell, Wells, and Calam (2001) used a non-clinical sample of children aged 7 to 11.5 years to investigate thought suppression effects using emotionally neutral and negatively valenced target thoughts. Care was taken to develop and pilot test instructions and procedures that were developmentally appropriate. Children were randomized into one of four groups: suppress-neutral target, monitor-neutral target, suppress-anxious target, or monitor-anxious target. In the two neutral target conditions, children listened to a neutral story. Children in the two anxious target groups discussed a personally relevant worrisome or scary thought with the experimenter. Children in the suppression groups were then asked to not think of the target story and children in the monitor groups were asked to think about anything including the target story. Subsequently, all children engaged in an unrestricted thought reporting period. The results indicated that, regardless of valence, children engaging in thought suppression reported significantly fewer target thoughts than children who were not suppressing. Thus, the initial enhancement effect was not found. Similarly, children did not demonstrate the rebound effect, in that no significant increase in target thoughts occurred during the unrestricted thought reporting phase. The authors note that despite the lack of tangible thought suppression effects as seen in the adult literature, manipulation checks indicated that children were able to understand and engage in the instructions of the experiment. In itself, this significant manipulation check is a key finding in that it indicates, even young children are able to engage in thought suppression as well as

thought monitoring, though the accuracy and comprehensiveness of these processes have yet to be determined. As Gaskell et al. (2001) note, it is possible that the ability to engage in thought suppression effectively, to where clear enhancement or rebound effects are demonstrated, may develop over time. To date, no investigation has examined children's development of the ability to engage in thought suppression.

1.2 Relation of Thought Suppression To Psychopathology

Over the past three decades, cognitive and cognitive-behavioral models of psychopathology have grown in prominence and have greatly influenced current conceptualizations of the development, maintenance, and treatment of many psychological disorders. One of the first, and arguably the most influential, of these models was Beck's (1976; Beck, Brown, Steer, Eidelson, & Riskind, 1987) model in which he hypothesized that recurrent and distorted cognitions form the basis of emotional disorders and that these distorted cognitions vary in thematic content depending upon the disorder. For example, Beck and colleagues proposed that depression was rooted in cognitions of perceived hopelessness and loss in the past, whereas anxiety has its basis in distorted cognitions about possible future losses or threats (Beck et al., 1987).

Given the emphasis placed on intrusive thoughts in cognitive models of psychopathology, the paradoxical effects of thought suppression, may be an additional factor in the development and maintenance of psychopathology. Wegner and Erber (1992) proposed that thought suppression is a dual process in which the person must search for distractor thoughts as well as actively monitor current cognitions for the presence of the target thought. Wegner and Erber believed that the active monitoring process increases the availability of the target thought, thus increasing the thought's expression. Likewise, Wegner et al. (1987) suggest that the distractor

target search coupled with the active monitoring process may produce associations and elaborations upon the to-be-suppressed target thought, further increasing the occurrence of the thought. This theorized net increase in unwanted cognitions when engaging in thought suppression has been incorporated into cognitive and cognitive-behavioral models of psychopathology including obsessive-compulsive disorder, generalized anxiety disorder, posttraumatic stress disorder, and major depressive disorder.

1.2.1 Obsessive-Compulsive Disorder

Perhaps the most logical application of the effects of thought suppression is within models of obsessive-compulsive disorder (OCD). According to the *Diagnostic and Statistical Manual of Mental Disorders*, OCD is typified by the experience of repetitive and intrusive thoughts, images, or impulses that are often nonsensical or are seen as personally inappropriate (DSM-IV-TR; American Psychiatric Association, 2000). Also included the definition of OCD symptomatology is that persons experiencing obsessions must attempt to "...ignore or suppress such thoughts, impulses, or images or to neutralize them with some other thought or action" (p. 462, American Psychiatric Association, 2000). Therefore, engagement in thought control is a diagnostic requirement for OCD involving obsessions. Rachman (1998) proposed a cognitive model of obsessions that implicated both the noxiousness of the intrusive thought as well as the effects of thought suppression as triggers for increasing the experience of the intrusive thought. In Rachman's model, individuals who experience unwanted thoughts as being of greater significance or as more aversive will subsequently be motivated to engage in thought suppression at a greater frequency or intensity. However, as Rachman notes, this increased engagement in suppression ultimately leads to an increase in the frequency of the obsession due to the rebound

effects noted by Wegner and colleagues (1987; 1992) as well as a failure to habituate to the intrusive thought (Wegner & Zanakos, 1994).

Salkovskis (1996) proposed a similar model in which the interpretation of the intrusive thought is such that the individual assumes increased personal responsibility for the thought and its perceived consequences. A heightened sense of personal responsibility is theorized to lead the sufferer to engage in neutralizing actions, which can include overuse of thought suppression. According to the model, reliance upon cognitive control leads to decreased inhibitory control of thoughts and actions due to the allocation of mental resources, thus leading to an increase in intrusive thoughts and compulsive behaviors (Salkovskis, 1996).

The proposed pathways and effects of thought suppression in Rachman and Salkovskis' models of OCD have been supported by experimental findings using negatively valenced and personally relevant target thoughts in clinical samples. Janick and Calamari (1999) compared participants with OCD to a non-anxious control sample. Overall, results did not find evidence supporting the initial enhancement or rebound effects in the OCD sample as compared to the non-clinical group. However, the authors note that a lack of power to detect any such differences limited the ability to draw conclusions. Tolin, Abramowitz, Przeworski, and Foa (2002) conducted an experiment comparing participants with OCD to non-anxious and socially anxious control groups. Unlike Janick and Calamari (1999), Tolin and colleagues used a white bear as the target thought due a concern that the use of personally relevant target thoughts may have been analogous to having participants with OCD suppress their obsessions, a behavior in which they likely already engage. The results revealed that participants with OCD demonstrated a significant increase in target thoughts during suppression as compared to a baseline thought reporting phase, thus demonstrating the initial enhancement effect. Neither control group

demonstrated the enhancement effect. The authors conclude that a deficit in successful thought suppression may differentiate OCD from other anxiety disorders. Within the cognitive-behavioral models of OCD, greater thought suppression ability may adequately control unwanted thoughts, limiting their frequency, duration, and/or intensity. However, if suppression ability is low, the individual may experience intrusive thoughts in greater frequency and may perceive those thoughts as more aversive due to the difficulty in effectively controlling them, thus beginning Rachman's (1998) cognitive model. Findings that those with OCD show significantly higher distress ratings of their unwanted thoughts as well as greater subjective uncontrollability of unwanted thoughts compared to controls (Calamari & Janeck, 1998) lends further evidence supporting the inclusion of thought control ability into cognitive-behavioral models of OCD.

1.2.2 Generalized Anxiety Disorder

Another clear target for the application of thought suppression is within models of generalized anxiety disorder (GAD). One of the core features of GAD is the recurrent experience of intrusive worries that specifically take on an uncontrollable quality (American Psychiatric Association, 2000). Wells (1995) proposed a cognitive model of GAD in which he delineates two types of worries: those regarding life events and those he termed "meta-worries" or worries about thoughts. In his model, worries become clinically significant when the focus turns inward becoming, essentially, worry about worries. He proposed several avenues for why such a transformation may occur. In particular, worry increases thought monitoring making individuals more aware of intrusive thoughts and that meta-worries prompt individuals to further engage in thought suppression causing the rebound effect. It has been suggested that worry itself can be used as a thought control strategy in that attention on one worry may be diverted to a less anxiety provoking worry (Wells, 1995; Wells & Davies, 1994). Overly strong beliefs about the

utility of worry are built up, serving to maintain the disorder. Likewise, frequent avoidance of worry and related stimuli prevent habituation to the anxiety that worries provoke (Wells, 1995).

In an effort to determine the influence of individual ability to control intrusive cognitions in GAD, Becker, Rink, Roth, and Margraf (1998) compared participants with GAD to those with social phobia and non-anxious controls on two thought suppression tasks: the first involved suppressing an emotionally neutral thought of a white bear, while the second task involved suppressing thoughts about a personally relevant intrusive worry. Participants with GAD demonstrated significantly more thought intrusions when suppressing worries than when suppressing emotionally neutral thoughts, thus showing an immediate enhancement effect for negatively valenced stimuli. Both control groups showed the opposite pattern, suggesting that deficits in thought suppression of worry-specific cognitions typify GAD but not social phobia. The authors also point out that cognitive control deficits do not appear to be universal as seen in the relatively successful suppression of white bear thoughts. Unlike OCD, thought suppression ability (or lack thereof) in GAD does not seem to be universal to all unwanted thoughts, just to those thoughts that typify the disorder (i.e. intrusive worry). This finding seems to support the model proposed by Wells (1995), in that those with GAD may hold heightened beliefs about the utility of worry and therefore may be less inclined to suppress such intrusions.

1.2.3 Posttraumatic Stress Disorder

Ehlers and Steil (1995) and Ehlers and Clark (2000) proposed a cognitive model of posttraumatic stress disorder (PTSD) that implicates thought suppression as a maintaining factor in the disorder. PTSD is characterized by persistent reexperiencing of the traumatic event via intrusive thoughts, memories, or perceptions as well as avoidance of associated stimuli, which can include avoidance of thoughts (American Psychiatric Association, 2000). Ehlers and

colleagues (2000; 1995) propose a three factor model of PTSD that includes deficits in memory processing for the event, overly negative valuations of the event and associated stimuli, and engagement in cognitive and behavioral control strategies that prevent processing of the event and serve to maintain the disorder. One cognitive thought control strategy Ehlers and colleagues propose is thought suppression.

Ehlers, Mayou, and Bryant (2003) tested a cognitive model of PTSD that includes thought suppression in a sample of children and adolescents who experienced a traffic accident. The overall prediction model accounted for approximately 50% of the variance, which was significantly greater than the prediction provided by children's subjective ratings of trauma severity. Within the model, each factor, including engagement in thought suppression, significantly predicted PTSD symptom severity. While their findings seem to support the role of thought suppression as a maintaining factor of PTSD in children, Ehlers et al. (2003) only used a single question to assess thought suppression. As such, additional research is needed to replicate their findings and determine the extent to which children with PTSD engage in thought suppression as well as the specific cognitive strategies they may use.

1.2.4 Depressive Disorders

Cognitive models of depression focus primarily on negative cognitions about past experiences and the subsequent attributions depressed individuals make about the self and the world based on those negative cognitions (Beck, 1976). Some of these cognitive distortions seem similar to the experience of intrusive thoughts or worries inherent in several anxiety disorders. For example, commonly experienced depressive cognitions are catastrophizing (thinking the worst possible outcome is the most likely to occur), selective abstraction (attending more strongly to negative events and discounting positive ones), and misattributing blame

(assuming greater personal responsibility for negative events than is warranted; Beck, Rush, Shaw, & Emery, 1979). Wenzloff, Wegner, and Roper (1988) suggest that deficits in thought suppression ability for negative cognitions may play a causal or maintaining role in depression. The authors tested their hypothesis in a series of thought suppression experiments using depressed and non-depressed college students. Participants read either a positive or a negative story and were asked to imagine themselves as the main character in each. They were then randomly assigned to a suppression or a control group in which they reported their frequency of intrusive target thoughts. Participants then performed the same task using the opposite valenced story. Overall, Wenzloff et al. (1988) found that depressed participants demonstrated the rebound effect when using negative target thoughts; non-depressed participants did not show such a trend. A second experiment indicated that the use of positively valenced distractor thoughts was more successful than using negatively valenced ones to suppress unwanted thoughts. However, the depressed participants showed significantly greater use of negative distraction than the control group. The authors speculated that negative cognitions might be more readily accessible to depressed individuals, causing depressed individuals to rely on negative distraction despite being a less effective strategy than using positive distraction. It seems, then, that depression may involve the use of inappropriate thought suppression techniques, leading to incomplete or unsuccessful suppression.

1.3 White Bear Suppression Inventory

While experimental studies have demonstrated the effects of thought suppression in both clinical and non-clinical samples, little information about the natural frequency of engaging in thought suppression can be gained from these investigations. As a result Wegner and Zanakos (1994) developed the White Bear Suppression Inventory (WBSI) to assess self-reported

frequency of thought suppression. An exploratory factor analysis revealed a single factor accounting for 55% of the variance (Wegner & Zanakos, 1994). Internal consistency was good for several non-clinical undergraduate samples ($\alpha = .87-.89$) and test-retest reliability varied by the length of time between administrations but was nevertheless adequate ($r_s = .69-.92$). Likewise, the WBSI demonstrated adequate convergence with measures of depression, anxiety, and obsessive-compulsive symptoms ($r_s = .38-.58$). Wegner and Zanakos (1994) also found that the WBSI significantly predicted the presence of obsessions but not compulsions in a sample of students with elevated scores on the Maudsley Obsessive-Compulsive Inventory (Rachman & Hodgson, 1980). Lastly, the study revealed that a model including the WBSI and a measure of depression sensitivity significantly predicted levels of depression. The initial study of the WBSI indicated adequate reliability and validity.

A subsequent investigation confirmed the original one-factor structure, which accounted for less variance than the original study (41%). The replication also found good internal consistency ($\alpha = .89$) and test-retest reliability ($r = .80$; Muris, Merckelbeck, & Horselenberg, 1996). Likewise, the WBSI correlated positively with measures of depression, worry, anxiety, and obsessive-compulsive symptomatology ($r = .35-.57$). Muris et al. (1996) also examined the WBSI in relation to the frequency of intrusive thoughts during an experimental investigation of thought suppression. The results demonstrated a significant relationship between frequency of intrusions during the experiment and self-reported frequency of thought suppression on the WBSI.

Despite these initial findings, an exploratory factor analysis by Blumberg (2000) used an alternate rotation procedure and revealed that a three-factor model best explained the variance of the WBSI. Blumberg suggested that these three factors consist of frequency of intrusive

thoughts, engagement in thought suppression, and use of distraction to avoid thoughts. Due to those new findings, Blumberg questioned the specificity of the WBSI in that it may not represent actual thought suppression but rather thought intrusion frequency regardless of the use of thought suppression or distraction. Likewise, McKay and Greisberg (2002) determined that, unlike previous findings, the WBSI did not correlate with a measure of obsessions and compulsions. They suggested this finding may be attributed to the interpretation that the WBSI primarily assesses success in thought suppression rather than thought suppression attempts generally.

It can also be argued that the WBSI has narrow utility in understanding the effects of thought suppression in clinical populations due to the limited amount and specificity of information the measure provides. That is, the WBSI gives information on the frequency of engagement in thought suppression and, as McKay and Greisberg point out, limited information about the frequency of intrusive thoughts. However, little information can be gleaned about the specific techniques people use to suppress unwanted thoughts. This is especially relevant in clinical populations where specific thought suppression techniques are thought to be adaptive and others maladaptive.

1.4 Thought Control Questionnaire

Understanding the specific methods with which individuals attempt to reduce unwanted thoughts may improve the effectiveness of therapeutic techniques by targeting and remediating ineffective cognitive control. To this end, Wells and Davies (1994) developed the Thought Control Questionnaire (TCQ) to better understand the specific methods used to control or suppress unwanted thoughts in adults aged 18 years and older. Fifty-nine items were developed from semi-structured interviews with clinical and nonclinical participants about the strategies they used to control unwanted thoughts. The clinical sample consisted mainly of patients

receiving treatment for OCD and GAD. A factor analysis revealed a six-factor structure and identified 26 items that did not significantly load onto any factors. The remaining 36 items were tested in a separate sample revealing a five-factor model accounting for 42% of the variance. An additional six items were removed to make the number of items in each factor consistent. The final version of the TCQ consisted of 30-items and five factors: distraction (e.g. “I keep myself busy”), social (e.g. “I talk to a friend about the thought”), worry (e.g. “I worry about more minor things instead”), punishment (e.g. “I get angry at myself for having the thought”), and reappraisal (e.g. “I try a different way of thinking about it”). Responses are recorded on a four-point Likert-type scale between 1 (never) and 4 (almost always). The TCQ is scored by summing the items within each subscale and then summing each subscale to get a total score. Some items require reverse scoring.

In their initial investigation using a non-clinical sample of undergraduate and graduate students, Wells and Davies found acceptable internal consistency for each subscale (α s = .64-.79). Interscale correlations were low, which suggests each subscale measures a unique thought control strategy. Finally, test-retest reliabilities for each scale were in the good to excellent range (r s = .67-.83). Wells and Davies also tested the TCQ’s relation to other measures of psychopathology including obsessive-compulsive behaviors, anxiety cognitions, and worry. From these correlations, the authors suggested that the distraction subscale represented a widely used thought control method but was not indicative of psychopathology specifically because no correlations between distraction and measures of negative cognitions were found. Similarly, the authors hypothesize that the social and reappraisal subscales may be associated with healthy coping because these subscales did not correlate with measures of psychopathology. Lastly, the

worry and punishment subscales were positively correlated with measures of disordered cognition, which suggests that these subscales represent maladaptive thought control strategies.

These initial findings suggest the TCQ is a valid and useful self-report measure; however, the psychometric properties were tested in non-clinical samples only and may not generalize to clinical populations. Reynolds and Wells (1999) examined the psychometric properties of the TCQ in a clinical sample of adult participants diagnosed with either major depression or PTSD. A principal components factor analysis revealed a six-factor model accounting for 55% of the variance. Reynolds and Wells suggested that the additional factor divided the original distraction factor into behavioral and cognitive types of distraction. However, the authors highlighted that the sixth factor consisted of only two items and that this is typically considered insufficient to comprise a factor (Kline, 1994). The internal consistency alphas for each subscale were between .65 and .78 and most subscales did not correlate with each other with a few notable exceptions. Reappraisal significantly and positively correlated with worry, distraction, and punishment. Likewise, worry and punishment were significantly correlated. The possibility exists that these intercorrelations simply indicated that those with psychopathology engaged in a variety of thought control strategies regularly, while non-clinical participants relied on a single or select few strategies. Convergent validity analyses showed negative correlations between distraction and measures of depression and PTSD, suggesting that distraction may serve as a positive coping skill. Similarly, within depressed participants, punishment was positively associated with anxiety and depressive symptoms. Social control was negatively associated with avoidance in participants with depression as well as those with PTSD, suggesting social control strategies are adaptive. Lastly, the reappraisal subscale was negatively correlated with depressive symptoms in the depressed group but not for those with PTSD. Reynolds and Wells (1999) posited that this

could indicate a deficit in the ability to use reappraisal in the development or maintenance of depression.

Overall, studies of the psychometric properties of the TCQ indicated that the measure has adequate reliability and validity, though discriminant validity was not assessed in either study. The studies also seemed to indicate that social, reappraisal, and distraction strategies are associated with positive coping or adaptability and that worry and punishment strategies may be indicative of maladaptive coping and psychopathology in adults. This conceptualization of adaptive and maladaptive thought suppression has been assessed in several studies examining TCQ profiles within specific disorders. Punishment, worry, reappraisal, and social thought control strategies were seen significantly more often in participants with OCD than non-anxious controls (Amir, Cashman, & Foa, 1997). However, when compared to anxious controls, only worry and punishment were significantly related to OCD symptomatology (Abramowitz, Whiteside, Kalsy, & Tolin, 2003; Tolin, Worhunsky, Brady, & Maltby, 2007). Additionally, treatment effects were found demonstrating a significant decrease in the use of punishment control and a significant increase in the use of distraction upon receiving an exposure and response prevention treatment for OCD (Abramowitz et al., 2003). These findings suggest that maladaptive thought control techniques (e.g. punishment and worry) are associated with OCD symptomatology and that cognitive-behavioral treatments effectively reduce engagement in such strategies.

Similar results have been found in GAD as well as depression; punishment and worry strategies were used more frequently in a GAD sample than by non-anxious controls who showed significantly greater use of distraction and social strategies (Coles & Heimberg, 2005). This suggests that distraction and social strategies are adaptive while punishment and worry are

maladaptive. Wells and Carter (2009) further demonstrated that participants with GAD, as well as those with depression, engaged in greater use of worry and punishment control strategies, a finding that was replicated in a second depressed sample (Watkins & Moulds, 2009). Those with GAD have been shown to use reappraisal significantly less often when compared to non-anxious controls and use punishment strategies more often than depressed participants (Wells & Carter, 2009). However, Wells and Carter (2009) found no difference in the use of worry strategies between those with depression and those with GAD. This finding seems to support the often noted similarities between generalized anxiety worries and depressive ruminations and may suggest similar maintaining mechanisms in both disorders. Wells and Carter (2009) also demonstrated that depressed participants used social strategies less frequently than non-depressed/anxious participants, which may be indicative of social withdrawal symptomatology specific to depression.

Cognitive models of psychopathology implicate thought suppression as playing slightly varying roles, but thought suppression is considered important to the conceptualization of several disorders nonetheless. However, studies of specific thought suppression techniques within disordered samples suggest that adaptive and maladaptive strategies exist and are largely the same regardless of the diagnosis. Principally, worry and punishment strategies appear to be maladaptive while distraction, social, and reappraisal appear to be adaptive or at the very least, unspecific to psychopathology in adults. No such information is currently known about the implications or processes of thought suppression in adolescent psychopathology.

1.5 Rationale for Current Study

While there exists a large body of research exploring thought suppression effects and strategy use among adults, a dearth of such research exists among adolescent populations.

Several accepted cognitive models of psychopathology include engagement in thought suppression as a factor in the development or maintenance of anxiety and mood disorders. Although there is evidence to support the inclusion of thought suppression in these models based on the adult literature, there is a lack of information on thought suppression using a developmental psychopathology perspective in adolescents. Additionally, no self-report measures have been published to assess adolescents' engagement in thought suppression or the various strategies used to control unwanted cognitions. Therefore, the purpose of this investigation is to develop and test the psychometric properties of an adolescent version of the Wells and Davies (1994) Thought Control Questionnaire. This new version, the Adolescent Thought Control Questionnaire (TCQ-A), could provide researchers and clinicians with valuable information regarding the cognitive processes of commonly experienced psychopathology in adolescents. Information gleaned from such a measure will hopefully be useful for future investigations in determining the accuracy of adult cognitive models of psychopathology in adolescent populations. Confirming or disconfirming such models also carries implications for designing efficacious cognitive and cognitive-behavioral treatments for youth.

1.6 Developmental Considerations

Several self-report measures of automatic cognitions for adolescent psychopathology have been developed (e.g. Ronan, Kendall, & Rowe, 1994; Schniering & Rapee, 2002; Stark, Humphrey, Laurent, Livingston, & Christopher, 1993). An examination of the reliability and validity of several of these measures suggests that children as young as six years old are able to report experiences of automatic thoughts. Awareness of one's own cognitive experiences (i.e., metacognition) is the first necessary step in being able to report upon strategies used in controlling those cognitions. However, the use of thought control techniques is arguably a more

complex process than mere awareness of intrusive thoughts. Therefore, additional developmental factors must be considered in determining an appropriate lower age limit for the proposed measure.

1.6.1 Self-Reporting of Metacognition

Educational psychologists have explored children's effective use of metacognition relating to learning by focusing exclusively on self-regulated learning strategies. Studies of children's self-knowledge of learning strategies can serve as an analog for metacognitive processes involving cognitive control and suppression. Sperling, Howard, Miller, and Murphy (2002) developed a self-report measure of children's educational metacognition (e.g. children's knowledge about their learning strategies). Using a sample of students in grades 3-9, the authors found evidence of adequate reliability and validity suggesting that children in this age group were able to report on educational knowledge as well as strategy usage during the learning process. Although educational metacognition is conceptually distinct from the use and reporting of thought control strategies, it appears that children as young as third-grade are able to report upon some metacognitive processes.

1.6.2 Executive Functioning

Executive functions are complex and essential abilities for performing purposeful and directed acts. Broadly, executive functions consist of skills such as maintaining and shifting attention, working memory, self-monitoring, goal setting, and planning (Anderson, Anderson, Northam, Jacobs, & Catroppa, 2001). All of these skills seem crucial to successfully using cognitive control strategies. In order to engage in thought control, one must be able to attend to intrusive thoughts, hold the thought in working memory while planning a strategy to suppress it, execute the strategy, and finally, assess the relative success or failure of the strategy. Thus, it

seems crucial to consider the development of executive functions in designing the proposed measure. Anderson et al. (2001) tested adolescents between the ages of 11 and 17 years on a wide range of neuropsychological tests designed to assess the various components of executive functioning. The results revealed an overall flat trend of development in the sample with some fluctuations in specific skills. While the study sample did not include children younger than 11 years, data using 7 and 9 year-olds from a previous study were included for comparison. The addition of this data showed a significant trend for improvement in processing speed and attention-shifting around the age of 9 years-old. Similarly, gains in goal-setting and strategy use were noted and became relatively stable around the ages of 11 and 12 years. Though tentative, these results might indicate that before the age of roughly 11 years, the majority of executive function skills have not fully developed to where such skills could be applied reliably to the complex process of thought suppression.

1.7 Hypotheses

The current study aimed to examine the psychometric properties of the TCQ-A, a self-report measure of thought suppression strategy use among adolescents. Several hypotheses regarding the properties of the measure were made: 1) based upon the five factors of the adult TCQ as well as the newly created items intended to measure thought stopping, an exploratory factor analysis was predicted to reveal a six-factor structure for the TCQ-A; 2) the hypothesized six factors were Distraction, Social, Worry, Punishment, Reappraisal, and Stopping; 3) the TCQ-A would demonstrate adequate internal consistency and test-retest reliability; 4) the TCQ-A would show acceptable convergent and discriminant validity. Specifically, it was hypothesized that the total score would have positive correlations with measures of anxiety and depressive symptomatology and a negative correlation to internal anxiety control. It was predicted that the

TCQ-A would not be related to externalizing psychopathology, as there is no evidence in theory or in the literature to support such a relationship. Lastly, based upon findings in the adult literature, the worry and punishment TCQ-A items were expected to demonstrate criterion validity by significantly predicting OCD and GAD symptomatology.

CHAPTER 2. METHODS

2.1 Participants and Sample Size

Participants were 212 adolescents between the ages of 12 and 18 years with a mean age of 15.53 ($SD = 2.06$). Given the aforementioned ages at which executive functions and metacognitive processes appear to mature, a minimum age limit of 12-years and a maximum limit of 18-years was set for the investigation to ensure developmental appropriateness. Adolescents were primarily female (67.5%) and were of mainly Caucasian descent (84.4%), with the next largest racial groups being African-American (7.1%), Bi-racial/Other (5.2%), and Asian (3.3%). Additionally, 5.7% of the sample self-identified as being of Hispanic origin. Parents of adolescents provided written informed consent and adolescents provided written informed assent in accordance with procedures approved by the Louisiana State University Institutional Review Board. Adolescents were excluded from participating if they were unable to understand the informed assent process or the constructs of the measures described in Chapter 3.

Several recommendations exist for minimum sample sizes required to conduct an exploratory factor analysis; however, the recommendations vary greatly. Some authors suggest a set minimum sample size between 150 (Guadagnoli & Velicer, 1988) and 300 (Comrey & Lee, 1992; Tabachnick & Fidell, 2001) individuals. Other recommendations suggest ideal ratios of participants per item, and they range from a minimum of three participants per item (Velicer & Fava, 1998) to ten participants per item (Gorsuch, 1983). The obtained sample size for the current investigation is 212 participants, which is a ratio of 8.83 participants per item on the measure of interest. This sample size falls within the middle of most sample size recommendations.

2.2 Recruitment and Incentives

Adolescents between the ages of 12 and 16 years inclusively were recruited from a regional junior-high and high school in Baton Rouge, Louisiana. Participants from the schools were offered the opportunity to enter a drawing to win one of three \$10 gift cards to an online music store. Upon completion of data collection, three participants were selected using a random number generator and were each mailed one gift card. Adolescents between the ages of 17 years and 18 years inclusively were recruited from the LSU undergraduate psychology student population and were offered two points of research participation credit as an incentive.

2.3 Measures

Adolescent Thought Control Questionnaire (TCQ-A). The TCQ-A is a self-report measure designed by the author to assess adolescents' frequency of engaging in several thought control strategies. The measure is designed to be developmentally appropriate for adolescents aged 12-18 years and uses wording of a Flesch-Kincaid Grade Level of 2.5. The TCQ-A is an adaptation of the adult Thought Control Questionnaire (TCQ; Wells & Davies, 1994) which asked adolescents to rate the frequency of engaging in each thought control statement on a 4-point Likert-type scale between 0 (never) and 3 (always). The adult version of the TCQ, as opposed to the White Bear Suppression Inventory (Wegner & Zanakos, 1994), was chosen as the model from which to base the current measure. The TCQ provides information on the frequency of engagement in specific thought suppression strategies, whereas the WBSI does not provide such detail. The adult version of the TCQ derives five subscales purported to measure distraction, social, worry, punishment, and reappraisal strategies of thought control. The 30 items comprising the adult version demonstrate ecological validity, as they were derived from direct patient and non-patient reports of thought control strategies.

Twenty items from the adult TCQ were chosen to comprise the five original subscales on the new TCQ-A and were reworded to improve developmental appropriateness. In addition, four new items were created for the TCQ-A to assess adolescents' engagement in thought stopping, a theorized sixth subscale for the measure under development. Thought stopping is a cognitive therapeutic technique originally described by Wolpe (1958; 1973) in which clients are asked to engage in their typical maladaptive cognitions, such as catastrophic thinking, and are gradually taught to interrupt or block those negative trains of thought by speaking or thinking the word "stop" and/or attempting to abruptly end the negative thought willfully. In clinical practice, clients are typically then instructed to engage in reappraisal thought control strategies. Without subsequent engagement in reappraisal techniques, thought stopping may become an unspecific or counterproductive thought control strategy (Bakker, 2009) and therefore warrants separate measurement from reappraisal strategies. The original adult version of the TCQ did not include items relating directly to the act of thought stopping; therefore, the TCQ-A was designed to assess Wells and Davies' five original strategies as well as thought stopping. Each of the theorized six TCQ-A subscales are designed to contain four items as follows: distraction (items 1, 7, 13, and 19), social (items 2, 8, 14, and 20), worry (items 3, 9, 15, and 21), punishment (items 4, 10, 16, and 22), reappraisal (items 5, 11, 17, and 23), and stopping (items 6, 12, 18, and 24; see appendix for a copy of the TCQ-A). In addition to the subscales, summing the items on the TCQ-A derives a total score designed to assess overall frequency of engagement in any type of thought suppression strategy.

The adult version of the TCQ included some items that required reverse scoring. To eliminate linguistic confusion for adolescents and to simplify scoring and responding, reverse scored items were not chosen for inclusion in the TCQ-A. To test for inconsistent or random

responding, an inconsistency index was developed, in which difference scores between sets of similar items are summed. A cut score of eight or higher on the index was chosen as an indicator of inconsistent or random responding, due to being approximately half of the total possible additive difference scores on the index. This cut-score was chosen based on the commonly used Inconsistency Index of the *Multidimensional Anxiety Scale for Children* (March, 1998), which also uses a recommended cut-score that is roughly half of the total possible index score.

Difference scores between the following items comprise the TCQ-A inconsistency index: items 2 and 14, items 3 and 9, items 4 and 16, items 5 and 11, and items 13 and 19.

Obsessive Compulsive Inventory-Child Version (OCI-CV). The OCI-CV (Foa et al., 2010) is a 21-item self-report measure assessing the frequency of OCD symptomatology in children and adolescents. Foa et al. (2010) examined the measure's reliability and validity in children, ranging in age from 7 to 17 years, who met diagnostic criteria for OCD. The OCI-CV was modeled after the adult Obsessive Compulsive Inventory (Foa, Kozak, Salkovskis, Coles, & Amir, 1998) and includes a total score as well as six subscales assessing washing, hoarding, doubting/checking, ordering, obsessing, and neutralizing subtypes. Children and adolescents rate the frequency of experiencing each item on a 3-point scale between 0 (never) and 2 (always). Foa et al. (2010) found the OCI-CV total score and each subscale to have excellent internal consistency with alphas ranging from .81 to .85. The OCI-CV total scale obtained excellent internal consistency in the current sample as well ($\alpha = .88$). The measure has been demonstrated to have adequate to good test-retest reliability for the total score as well as the subscales ($r_s = .60-.89$). The OCI-CV was found to correlate with parent, child, and clinician administered measures of OCD as well as child reported anxiety symptomatology broadly, thus demonstrating sufficient convergent validity (Foa et al., 2010). Divergent validity was assessed using child

reported depressive symptomatology; however, Foa et al. (2010) note that further study of the OCI-CV's divergent validity is necessary due to strong associations between OCD and depression.

Penn State Worry Questionnaire for Children (PSWQ-C). The PSWQ-C (Chorpita, Tracey, Brown, Collica, & Barlow, 1997) is a 14-item self-report measure assessing worry in children ranging in age from 6 to 18 years. Children and adolescents rate their level of agreement with each item on a 4-point Likert-type scale between 0 (not at all true) and 3 (always true). Previous studies including clinical and nonclinical samples have reported acceptable to excellent internal consistency with alphas ranging from .76 to .90 (Chorpita et al., 1997; Laugesen, Dugas, & Bukowski, 2003; Muris, Meesters, & Gobel, 2001; Muris, Meesters, Merckelbach, & Hülsebeck, 2000). Internal consistency in the current sample was poor ($\alpha = .43$). The PSWQ-C has been shown to have excellent test-retest reliability and sufficient convergent and divergent validity (Chorpita et al., 1997; Muris et al., 2001).

Anxiety Control Questionnaire-Child Form (ACQ-C). The ACQ-C (Weems, Silverman, Rapee, & Pina, 2003) is a 30-item self-report measure assessing children's perceived control over external and internal experiences of anxiety. The ACQ-C yields a total score, as well as an internal reactions score and an external reactions score. Children rate their level of agreement with each item on a 4-point Likert-type scale from 0 (none) to 4 (very, very much) with lower scores indicating less perceived control. Weems et al. previously demonstrated excellent internal consistency for the total score as well as the two subscales in clinical and nonclinical samples of children aged 9 to 17 years ($\alpha \geq .86$; Weems et al., 2003). Internal consistency in the current sample was equally high ($\alpha = .92$). Similarly, the ACQ-C was found to significantly correlate with self-reported anxiety and a measure assessing children's locus of control, thus

demonstrating adequate convergent validity (Weems et al., 2003). Test-retest reliability has not yet been assessed in the ACQ-C.

Youth Self Report form (YSR). The YSR (Achenbach & Rescorla, 2001) is a 112-item self-report scale assessing behavioral and emotional concerns in children ages 11 to 18 years. The YSR contains several subscales, however only the Anxious/Depressed, Thought Problems, Internalizing Problems, Attention Problems, and Delinquent Behavior subscales were used to examine convergent and discriminate validity. In previous studies, internal consistencies for the YSR subscales have been found to be in the adequate to excellent range ($\alpha = .78-.90$; Achenbach & Rescorla, 2001). Internal consistency for the total measure in the current sample was excellent ($\alpha = .93$). Likewise, studies have demonstrated that the YSR subscales have good test-retest reliability ($r_s = .78-.88$). The YSR has been found to have adequate criterion-related validity by significantly discriminating between clinically referred and non-referred children on each of the subscales of interest in the current investigation. Similarly, the YSR subscales of interest to the present investigation have been shown to significantly correlate with relevant DSM-IV diagnoses, thus demonstrating adequate convergent validity (Achenbach & Rescorla, 2001).

2.4 Procedures

The current investigation was reviewed and approved by the Louisiana State University Institutional Review Board. Parental consent forms were provided to all students enrolled in 6th to 8th grade physical education, 9th to 10th grade health science, or 9th grade computing courses. Those students with returned and signed parental consent forms were asked to provide written assent on the day of data collection. Students whose parent/guardian provided consent and who themselves provided assent were administered the aforementioned measures during their

respective course periods in groups of 10-30 students. Upon completion of the packet of measures, students were then provided with a second copy of the TCQ-A, along with a pre-addressed and stamped envelope, and were provided with instructions for returning the completed measure in approximately two weeks after their initial participation.

University undergraduate students scheduled themselves to attend an experiment session with this researcher in a classroom on the LSU campus. Students who were 18 years of age provided informed consent; students who were 17 years of age provided a copy of a signed parental research participation waiver and provided written assent to participate. Study sessions were held in groups of 5-15 students. Students were administered the questionnaire packet and were then given instructions to complete and return a second copy of the TCQ-A in approximately two weeks following their initial participation.

CHAPTER 3. RESULTS

3.1 Response Style Validity Check and Missing Value Procedures

The previously described inconsistency index from the TCQ-A was examined to ensure the validity of response styles for all subsequent analyses. Two participants scored at or above the cut score of eight and were therefore excluded from subsequent reliability and validity analyses. A cut score of eight was viewed as a conservative estimate of inconsistent responding due to being approximately half of the total possible additive difference scores on the index.

Missing values for all measures were replaced by the means of the remaining items within the same subscale or from the total measure for measures without subscales. Missing values were only replaced if fewer than 10% of the items from the measure were missing. Four participants were excluded from subsequent analyses due to missing more than 10% of the items on the TCQ-A, thereby making missing value replacement unwarranted. As a result, the sample included 206 adolescents.

3.2 Clinical Status of Sample

Due to community, as opposed to clinic-referred, recruitment methods, it was likely that the obtained participants would compose a primarily non-clinical sample. The current battery of measures cannot definitively ascertain diagnostic status for any mental health disorder.

However, clinical indices from the included measures were examined for preliminary evidence of participants' clinical status. First, t-scores from the Anxious/Depressed, Attention Problems, Internalizing Problems, and Externalizing Problems subscales of the YSR were examined as possible indicators of clinical psychopathology. Twenty-three participants (10.85%) were identified with t-scores of 70 or greater on any of the aforementioned subscales, generally indicating statistically significant psychopathology endorsement. Twenty participants (9.43%)

demonstrated statistically elevated scores on either the Anxious/Depressed or Internalizing Problems subscales, indicating symptom endorsements potentially consistent with either anxiety or depression. An additional three participants (1.41%) demonstrated elevated scores on the Attention Problems subscale, indicating symptom endorsements potentially consistent with attention or behavior disorders. No participant demonstrated a t-score of 70 or greater on the Externalizing Problems subscale. The mean t-scores from the YSR subscales indicated that the overall sample did not show clinical elevations on any of the aforementioned subscales:

Anxious/Depressed = 55.50 (SD = 6.79), Attention Problems = 56.40 (SD = 7.22), Internalizing Disorders = 51.53 (SD = 11.09), and Externalizing Disorders = 49.83 (SD = 8.45).

Second, total scores from the OCI-CV and PSWQ-C were examined and compared to prior research performed with clinical samples of children and adolescents with OCD and GAD respectively. Foa and colleagues (2010) found a mean OCI-CV total score of 10.16 (SD = 7.58) following cognitive-behavioral therapy for OCD in a sample of 109 children and adolescents. Therefore, a score of 10 or greater was considered of possible clinical significance in the current sample, though the authors have not developed a formal clinical cut-score on the OCI-CV. The current sample included 92 participants (43.40%) who scored above a total score of 10 on the OCI-CV. The mean OCI-CV total score in the present sample was 10.60 (SD = 6.88) indicating that, the sample as a whole appeared approximately consistent with the scores of youth who were considered to be OCD treatment responders.

Lastly, total scores from the PSWQ-C were examined and compared to the mean total score of adolescents with a diagnosis of GAD in previous research (24.09; SD = 9.85; Pestle, Chorpita, & Schiffman, 2008). For the current sample, 173 participants (81.60%) scored above 14.24 (one standard deviation below the mean score obtain by Pestle and colleagues). The mean

PSWQ-C score in the current sample was 18.28 (SD = 4.24), indicating that the sample as a whole endorsed higher levels of worry than expected but less than a demographically comparable GAD sample.

3.3 Demonstration of Intrusive Thought Experiences

To demonstrate that adolescents in the current sample experienced intrusive or unwanted thoughts, even in the absence of clinical disorders, items from the OCI-CV and PSWQ-C were chosen for their face-validity in measuring negative thought experiences. Endorsements of “sometimes” or greater on the following items from the OCI-CV were considered as evidence of intrusive thought experiences: “1. I think about bad things and I can’t stop” and “11. I get upset by bad thoughts.” Endorsements of “sometimes true” or greater on the following items from the PSWQ-C were likewise considered as evidence of intrusive worries or negative thought experiences: “1. My worries really bother me” and “12. I notice that I have been worrying about things.” Of the obtained sample, 42.1% ($N = 90$) endorsed both items on the OCI-CV at a level of “sometimes” or greater and 70.3% ($N = 149$) endorsed both items on the PSWQ-C at a level of “sometimes true” or greater, indicating that despite the lack of clinical diagnoses in the sample, the majority of participants reported experiencing intrusive thoughts that would be the target of thought suppression efforts.

3.4 Preliminary Analyses

A factorial analysis of variance was used to test for sample demographic influences on total TCQ-A scores. The examined sample characteristics were gender, race, recruitment method (i.e., undergraduates vs. middle and high school students), and age (median split of the age range). No significant main effects were found for any of the aforementioned variables.

Therefore, all subsequent analyses were performed using the entire included sample, with no corrections for demographic variables.

3.5 Exploratory Factor Analysis

A principal factor analysis (PFA) using the oblique promax rotation procedure was performed to determine the factor structure of the TCQ-A. Principal factor analysis was chosen due to producing better approximations of confirmatory factor analytic results compared to component analyses (see Floyd & Widaman, 1995). Promax rotation was employed to account for inter-factor correlations given that the theoretical constructs of the subscales are not orthogonal. Using the Kaiser Criterion, only factors with eigenvalues equal to or greater than one were considered. Additionally, a scree plot, the number of items loading on each factor (i.e. minimum of 3; Kline, 1994), and the six theoretical subscales of the TCQ-A were considered in determining the interpretability of the factor solution. In the initial PFA, seven factors were extracted with eigenvalues of one or greater; however, the last three extracted factors contained fewer than three items each. Additionally, an examination of the scree plot supported a five-factor solution and an examination of the item loadings did not conform to theoretical expectations.

Due to the poor factor structure of the 24-item version of the TCQ-A, items were examined for removal to improve the factor solution. Retaining or removing items was decided by examining items' theoretical importance, setting a minimum factor loading standard of .30 (Cattell, 1973), and an assessment of item communalities. All four items from the stopping subscale initially loaded with items on the distraction subscale. Due to the stopping subscale's redundancy in measurement with distraction, items 6, 12, 18, and 24 were removed and a second PFA was performed with the remaining 20 items. The second PFA again revealed seven factors

with eigenvalues greater than one. As with the initial analysis, an examination of the scree plot as well as the number of items loading on each factor revealed a five-factor solution. Removing the four items from the stopping subscale did not improve upon the interpretability of the TCQ-A's factor structure beyond removing redundant items. Therefore, additional items were considered for removal. After examining item communalities, items 8 and 22 were identified as problematic due to having low communalities. Additionally, items 1 and 20 were considered problematic due to either poor or multiple factor loadings. Upon examining the theoretical importance of items 1, 8, 20, and 22, it was decided that items 1, 20, and 22 should be removed, while item 8 should be retained due to theoretical importance and to maintain a minimum number of items necessary to create a social factor (i.e. removing both items 8 and 22 would leave only two items assessing social methods of thought suppression). To maintain a consistent number of items on all theorized subscales, the single items with the lowest factor loadings from the distraction, reappraisal, and worry subscales were also removed (items 15 and 17).

After removing problematic items, a third PFA was computed with the revised 15-item version of the TCQ-A, revealing five factors with eigenvalues greater than one. An examination of the scree plot further supported the five-factor solution. All items theorized to comprise the five remaining subscales loaded together onto individual factors, with the exception of item 10 (punishment), which loaded equivalently on two factors along with items from the worry and reappraisal subscales respectively. Therefore, item 10 was removed from the measure and the final factor structure achieved with the 14-item version of the TCQ-A replicated that previously achieved, and accounted for 46.95% of the variance. Item factor loadings and communalities are presented in Table 1.

Table 1

TCQ-A Factor Loadings and Item Communalities

Item	Factor Loadings					CM
	1	2	3	4	5	
(7) I think about something good or happy instead.	.72	-.03	.019	-.03	-.09	.51
(13) I work on something instead (like homework or chores).	.70	.02	-.01	-.01	.21	.52
(19) I focus on something else.	.69	-.00	-.05	.04	-.03	.49
(11) I ask myself if the thought is really true.	-.11	.84	-.10	.02	.09	.68
(5) I ask myself if the thought is really all that bad.	-.03	.60	.14	-.01	-.11	.40
(23) I tell myself, “it’s okay, it’s just a thought.”	.20	.58	.07	-.04	-.09	.45
(2) I ask a friend if they have similar thoughts.	-.04	.01	.81	.04	.04	.67
(14) I talk to a friend about the thought.	-.05	-.00	.76	.00	.05	.58
(8) I talk to an adult about the thought (like a parent, teacher, coach, or pastor/rabbi).	.14	.16	.34	-.03	-.04	.21
(9) I worry about something else instead.	.07	-.15	.05	.76	-.06	.55
(21) I think about a smaller problem I’m having instead.	.07	.07	-.00	.54	-.07	.33
(3) I think about something else that’s negative or bad.	-.19	.10	-.03	.46	.11	.28
(16) I punish myself for having the thought.	.02	-.10	.07	-.07	.82	.62
(4) I get mad or frustrated at myself for having the thought.	.09	.17	-.06	.19	.37	.30

Note: CM = communalities; TCQ-A = Adolescent Thought Control Questionnaire; (#) denotes item numbers from the original 24-item measure.

Due to removing item 10, the fifth factor (punishment) contained only two items, thus not meeting the minimum standard of three items comprising a factor. However, due to the relatively parsimonious factor solution obtained otherwise, the factor structure achieved with the revised 14-item version of the TCQ-A was considered interpretable. Based upon factor content, the five factors obtained were labeled thusly: factor 1 = “Distraction,” factor 2 = “Reappraisal,” factor 3 = “Social,” factor 4 = “Worry,” and factor 5 = “Punishment.” To ensure common measurement within the factors, the subscales were examined in individual PFAs and all were found to be unifactorial.

3.6 Internal Consistency and Test-Retest Reliability

The following reliability and validity analyses were performed using the 14-item TCQ-A. Internal consistency for the overall measure, as well as each identified factor, was assessed using Chronbach's alpha. The total measure achieved adequate internal consistency ($\alpha = .74$). Each subscale individually obtained questionable to adequate internal consistency (α 's = .59-.72), with the exception of Punishment, which demonstrated unacceptable internal consistency in the obtained samples ($\alpha = .46$). Internal consistencies for all scales are reported in Table 2.

Table 2

Internal Consistency and Test-Retest Reliability of the TCQ-A

	Internal Consistency ($N = 205$)	Test-Retest Reliability ($N = 86$)
Total	.74	.69**
Distraction	.72	.52**
Reappraisal	.69	.67**
Social	.69	.64**
Worry	.59	.42**
Punishment	.46	.72**

Note: ** $p < .01$; TCQ-A = Adolescent Thought Control Questionnaire.

Test-retest reliability was assessed using a Pearson product-moment correlation between the first and second administrations of the measure for the total score, as well as each subscale individually. Test-retest reliability correlations are presented in Table 2. A 40.57% ($N = 86$) return rate for the second administration of the TCQ-A was obtained. Correlations between the initial and one-to-two week delayed administrations of the TCQ-A were moderate for the total score ($r = .69$) and were moderate to strong for the individual subscales (r s = .42-.72).

3.7 Construct Validity

To assess each subscale's construct validity, Pearson product moment correlations were computed between the total score and each subscale and among the individual subscales.

Subscale intercorrelations are presented in Table 3. All subscales correlations with the total score were strong ($r_s = .58 - .73$), suggesting each measures the broad construct of thought suppression. Correlations among the subscales were weak to moderate ($r_s = .11 - .31$), suggesting that the subscales are loosely related but that each measures a unique thought suppression strategy.

Table 3

Intercorrelations Among TCQ-A Subscales

	Distraction	Reappraisal	Social	Worry	Punishment
Distraction	-				
Reappraisal	.25**	-			
Social	.12	.31**	-		
Worry	.19**	.26**	.24**	-	
Punishment	.11	.19**	.19**	.27**	-
Total	.61**	.72**	.62**	.58**	.42**

Note: ** $p < .01$; TCQ-A = Adolescent Thought Control Questionnaire.

3.8 Convergent Validity

Pearson product moment correlations between the TCQ-A and measures of theoretically related symptomatology were performed to assess convergent validity and are presented in Table 4. Previous research with adults has shown that engagement in thought suppression – and worry and punishment suppression strategies in particular – is associated with OCD and GAD symptomatology (Abramowitz et al., 2003; Coles & Heimberg, 2005; Tolin et al., 2007; Wells & Carter, 2009). Therefore, correlations with the TCQ-A and measures of worry and obsessive-compulsive symptoms (i.e. OCI-CV and PSWQ-C) were examined for evidence of convergent validity. The TCQ-A total score, as well as all five subscales significantly correlated with measures of OCD and worry symptomatology; however, total score and worry and punishment subscales primarily demonstrated correlations of a meaningful magnitude. The observed

correlations with the OCI-CV and PSWQ-C are suggestive that worry and punishment thought suppression types – and overall engagement in thought suppression – is associated with anxious psychopathology in adolescents, a finding that replicates such associations in the adult literature.

Table 4

Convergent and Divergent Validity Correlations

	TCQ-A Total	Distraction	Reappraisal	Social	Worry	Punishment
OCI-CV total	.47**	.20**	.31**	.15*	.42**	.51**
PSWQ-C total	.44**	.20**	.23**	.15*	.44**	.49**
ACQ-C						
Internal	-.21**	.03	-.07	-.08	-.33**	-.43**
YSR						
Anx/Dep	.35**	.18**	.15*	.04	.40**	.51**
Thought Px.	.21**	.07	.10	.07	.22**	.30**
Internalizing	.34**	.18**	.15*	.04	.38**	.50**
Attn. Px.	.10	-.02	.08	.02	.19**	.09
Delinquent	.11	-.08	.13	.06	.12	.16*

Note: * $p < .05$; ** $p < .01$; TCQ-A = Adolescent Thought Control Questionnaire; OCI-CV = Obsessive Compulsive Inventory-Child Version; PSWQ-C = Penn State Worry Questionnaire for Children; ACQ-C = Anxiety Control Questionnaire for Children; YSR = Youth Self Report inventory; Anx/Dep = Anxious/Depressed subscale; Attn. Px. = Attention Problems subscale.

Further, thought suppression has been shown to be associated with other internalizing disorders such as major depression, PTSD, and specific phobias among adult samples (Muris, Merchelbeck, Horselenberg, Sijsenaar, & Leeuw, 1997; Reynolds & Wells, 1999). Therefore, correlations with internalizing disorder symptoms on the YSR (i.e. anxious/depressed and internalizing subscales) were examined for evidence of convergent validity. A relationship between the TCQ-A and the thought problems subscale of the YSR was also examined, as many of the items comprising the thought problems subscale are similar in type to symptoms of OCD and intrusive thought experiences broadly. All three YSR subscales significantly correlated with the TCQ-A total score as well as the worry and punishment subscales, again suggesting that

worry and punishment thought suppression strategies are associated with internalizing psychopathology in adolescents. Interestingly, no correlations were seen between the YSR internalizing, anxious/depressed, or thought problems subscales and the reappraisal or social subscales of the TCQ-A, which suggests that reappraisal and social methods of thought control may not be indicative of internalizing psychopathology.

Lastly, correlations between the ACQ-C internal subscale and TCQ-A total score and each subscale were examined for convergent validity due to the two measures' similar constructs of controlling internal experiences of anxiety and/or anxious cognitions. As the ACQ-C yields higher scores for greater anxiety control, it was expected that negative correlations would be found between the TCQ-A and the ACQ-C internal scale. The TCQ-A total score as well as the worry and punishment subscales significantly and negatively correlated with the internal subscales of the ACQ-C. Correlations with the distraction, social, and reappraisal subscales were not significant.

3.9 Discriminant Validity

Discriminant validity was assessed by examining correlations between the TCQ-A total score and the attention problems and delinquent behavior subscales of the YSR as there is little theoretical basis for a relationship to exist between externalizing cognitions and behaviors and internalizing cognitive processes such as thought suppression (see Table 4). The attention problems subscale of the YSR was of particular interest when demonstrating discriminant validity, as it is necessary to establish that adolescents' reports of thought suppression on the TCQ-A do not simply reflect poor attentional resources. As expected, measures of externalizing symptomatology did not correlate with the TCQ-A total score or any subscale, with the exception of the worry subscale, which was weakly associated with attention problems.

3.10 Criterion Validity

Cognitive models of OCD and GAD have included thought suppression engagement as an important variable in the development and/or maintenance of those disorders (Ehlers & Steil, 1995; Rachman, 1998; Salkovskis, 1996; Wells, 1995; Wenzloff et al., 1988). Specifically, adult researchers of thought suppression and anxiety have theorized that worry and punishment thought control strategies are particularly implicated in OCD and GAD. Therefore, the TCQ-A's criterion validity was assessed by examining multiple regression analyses using the total scale as well as each subscale as predictors of worry frequency on the PSWQ-C and obsessions on the OCI-CV. As expected, the TCQ-A total score predicted and explained a significant proportion of the variance in obsessive-compulsive symptoms on the OCI-CV, $\beta = .47$, $t(204) = 7.57$, $p < .01$, $R^2 = .22$, $F(1, 204) = 57.23$, $p < .01$. The total score similarly predicted and explained a significant amount of the variance in worry frequency on the PSWQ-C, $\beta = .44$, $t(205) = 6.96$, $p < .01$, $R^2 = .19$, $F(1, 205) = 48.43$, $p < .01$.

All five subscales of the TCQ-A were stepwise entered into two regression models separately predicting OCI-CV and PSWQ-C scores. While it was expected that Worry and Punishment would significantly predict obsessive-compulsive and generalized anxiety symptomatology, Distraction, Social, and Reappraisal thought control methods were included in the models to illustrate Worry and Punishment's unique predictive value above that of neutral or adaptive thought suppression strategies. The overall model for obsessive-compulsive traits was significant, $F(3, 202) = 39.32$, $p < .01$. Punishment ($\beta = .41$, $p < .01$), Worry ($\beta = .27$, $p < .01$), and Reappraisal ($\beta = .16$, $p < .01$) significantly accounted for 36.9% of the variance of OCI-CV total scores collectively. Likewise, the model for generalized anxiety traits was significant, $F(2,$

205) = 52.50, $p < .01$. Punishment ($\beta = .40, p < .01$) and Worry ($\beta = .33, p < .01$) significantly accounted for 33.9% of the variance in PSWQ-C total scores.

CHAPTER 4. DISCUSSION

While an abundance of studies have examined thought suppression effects and correlates in adult samples, virtually nothing is known of thought suppression among youth. Both limited attention given to cognitive processes in child and adolescent psychopathology broadly, as well as the lack of an empirically derived and validated instrument to measure thought suppression in youth, have likely contributed to the scarcity of adolescent thought suppression research. Therefore, to begin the process of filling the gap in the literature, the current investigation presents the initial psychometric properties of the Adolescent Thought Control Questionnaire (TCQ-A), an adaptation of the adult Thought Control Questionnaire (TCQ; Wells & Davies, 1994). Due to Wells and Davies' original methodology of item development, the 14 items on the revised TCQ-A demonstrate ecological validity in that the thought control techniques that each item assesses were derived from direct patient and non-patient reports of thought suppression strategies. Likewise, the adult version of the TCQ has been shown to be reliable and valid with a stable factor structure in clinical and non-clinical adult samples (Wells & Davies, 1994; Reynolds & Wells, 1999) and therefore served as an empirically tested model from which to base the TCQ-A items.

For the TCQ-A, an attempt was made to address a missing theoretical thought control technique on the adult TCQ by including four newly developed items intended to tap the construct of thought stopping. It was expected that the 24-item version of the TCQ-A would demonstrate a six-factor structure, which would consist of items measuring distraction, social, worry, punishment, reappraisal, and stopping thought suppression strategies respectively. However, an initial principal factor analysis revealed a poor factor structure with many items showing statistically and theoretically problematic factor loadings, namely the newly created

Stopping thought control items. After removing the four stopping items as well as six other problematic items, the 14-item version of the TCQ-A achieved a factor solution that conformed to theoretical expectations and replicated the five-factor structure from the adult TCQ (Wells & Davies, 1994). The final five-factor solution accounted for an equivalent proportion of variance (46.96%) compared to that explained by the adult version in a non-clinical sample (42%; Wells & Davies, 1994). In addition to replicating the factor structure of the parent measure, the TCQ-A has the benefit of being shorter, with only 14 items as compared to the original 30 from the adult version. Therefore, the TCQ-A has the advantages of being less cumbersome and quicker to administer for younger respondents such as adolescents.

4.1 Reliability

Overall, the current examination of the psychometric properties of the newly developed TCQ-A demonstrated that adolescents as young as 12 years of age were able to report upon their engagement in distinct thought suppression techniques using the measure. The TCQ-A demonstrated adequate evidence of internal consistency that was approximately equivalent to reliability findings in the adult version (Reynolds & Wells, 1999; Wells & Davies, 1994). Internal consistencies for the total scale as well as the Distraction, Reappraisal, and Social subscales were in the questionable-to-adequate range and test-retest reliability was moderate to strong. Internal consistency for the Worry and Punishment subscales were unacceptable and were likely due to poor subscale and/or item constructions for those measures (i.e. only two items comprising the Punishment scale). The reliability results observed in the current study are not unexpected when considering factors of cognitive development in adolescents that might forecast lower reliabilities of self-reported metacognitive processes given ongoing neurological development such as executive functioning. Improving the internal consistency of the overall

measure as well as the Worry and Punishment subscales specifically should be a chief focus of future research with the TCQ-A and could potentially be achieved by creating new, developmentally appropriate items to include in the subscales.

4.2 Validity

Construct validity of the Adolescent Thought Control Questionnaire was assessed in several ways. The TCQ-A demonstrated moderate to strong intercorrelations between the total score and the five subscales, indicating that each subscale is significantly related to the broader construct of thought suppression. However, intercorrelations among the individual subscales were weak to moderate, therefore suggesting that each measures a unique method of suppressing unwanted thoughts. The only intercorrelations of any meaningful magnitude, despite more achieving statistical but not practical significance, were observed between the Social and Reappraisal subscales, the Worry and Reappraisal subscales, and between the Worry and Punishment subscales. Moderate to weak relationships between the aforementioned subscales conform to theoretical conceptualizations of each suppression method. For example, Wells and Davies originally believed the Social and Reappraisal subscales indicated positive or adaptive methods of thought control, not typically associated with psychopathology (1994). Later correlational studies of thought suppression techniques and psychopathology, such as GAD, OCD, PTSD, and depression, have supported the conceptualization of social and reappraisal thought control methods as being adaptive (Abramowitz et al., 2003; Reynolds & Wells, 1999). Similarly, Worry and Punishment suppression methods were believed to indicate negative or maladaptive coping strategies for managing unpleasant thoughts (Wells & Davies, 1994) and were found to be positively related to psychopathology in several investigations (Abramowitz et al., 2003; Reynolds & Wells, 1999; Tolin et al., 2007). In the current sample, the TCQ-A

demonstrated significant positive correlations between the Worry and Punishment subscales and measures of internalizing disorder symptomatology (i.e. OCI-CV, PSWQ-C, ACQ-C, and YSR subscales). Therefore, the TCQ-A conforms to previous findings in adult samples of relations between maladaptive thought control strategies and reports of elevated of internalizing symptoms. Unlike previous research with adults, no significant negative correlations were observed between the so-called adaptive thought suppression techniques (i.e. Social and Reappraisal) and measures of psychopathology. Instead, no correlation or, in some cases, positive correlations were observed (though arguably these correlations were of a weak magnitude). While such findings clearly require replication before conclusions can be definitively drawn, the overall lack of associations between measures of psychopathology and positive thought control strategies measured by the TCQ-A suggests that adolescents may not show positive coping by engaging in thought suppression as has been demonstrated in adults. Rather, these preliminary results suggest that only neutral (i.e. Distraction, Social, and Reappraisal) or negative coping – via Worry and Punishment thought control methods – is seen among adolescents. If replicated in future research, the strong associations between negative thought control strategies and increased reports of internalizing symptomatology may indicate a partial etiological pathway for the development of internalizing problems and should be explored as such in subsequent research.

In addition to subscale intercorrelations, content validity was also considered when designing the TCQ-A and assessing its subsequent construct validity. When adapting the adult TCQ for use with adolescents, an attempt was made to improve the content validity of the measure by including an additional thought control technique missing from the original measure (i.e. thought stopping). Wells and Davies' ecologically valid method of deriving items to tap all

theorized thought control techniques provided a rather exhaustive item pool, covering a variety of suppression methodologies, thus showing initially high content validity despite the lack of thought stopping measurement. Nevertheless, recent empirical and clinical attention garnered by thought stopping therapeutic techniques (see Bakker, 2009) warranted an attempt to include the construct in the TCQ-A. The items created to measure thought stopping performed poorly when examining the results of the exploratory factor analysis; all four thought stopping items loaded highly with Distraction items, creating measurement redundancy and clearly demonstrating that the new items did not measure the intended construct. There are several possibilities for the poor performance of the thought stopping items, the most likely of which was poor item construction. The four items comprising the initial thought stopping subscale were as follows: “I try to push the thought out of my head,” “I try to block-out the thought,” “I try hard not to think about the thought again in the future,” and “I try hard to avoid thinking about the thought.” The original intent of the four stopping items was to tap dual aspects of thought stopping, both the initial act of stopping the thought (i.e., “pushing” the thought from one’s consciousness) as well as avoiding or preventing the thought’s return. An objective re-examination of the aforementioned stopping items suggests significant overlap with distraction techniques, as thought avoidance will often involve distraction methods. Likewise, items truly measuring clinical thought stopping methodologies (i.e. saying or thinking the word “stop”) were not included initially, as it was believed that such acts would demonstrate a low base rate in non-clinical samples. Therefore, the four newly created items seem to have high content overlap with Distraction thought control methods and low content validity for the originally intended subscale of thought stopping. Due to their poor performance and redundancy with Distraction items, the thought stopping items were removed from the final version of the TCQ-A, which, along with removing some other

problematic items, improved the overall factor structure and objectively assessed content validity of the measure.

A third component of construct validity, concurrent validity, was difficult to assess, as no other measures of thought suppression currently exist for use with children or adolescents. Therefore, relations to theoretically similar constructs of psychopathology were examined for evidence of concurrent validity. The TCQ-A was examined for relationships to measures of internalizing disorders broadly, as well as OCD and GAD specifically, as cognitive models of such disorders suggest that thought suppression engagement is a developmental and/or maintaining factor. Wells and Davies (1994) chose to examine similar constructs among non-clinical samples when initially testing the psychometrics of the adult TCQ and therefore, concurrent validity between the adult and adolescent versions can be reasonably compared. Overall, the TCQ-A total score showed significant relationships with measures of internalizing psychopathology on the OCI-CV, PSWQ-C, and YSR subscales. The specific subscales were also investigated for relations to psychopathology; however, as stated previously, only the Worry and Punishment subscales showed practically and statistically significant relationships to such measures, indicating that Worry and Punishment may be indicative of maladaptive coping and/or pathological cognitive processes. Likewise, as expected, the total score as well as the Worry and Punishment subscales were shown to have significant negative correlations with self-reported anxiety control on the ACQ-C, suggesting that increased efficacy for anxiety control is negatively associated with the frequency of engagement in overall thought suppression as well as maladaptive thought suppression strategies specifically.

Contrary to expectations, the Distraction, Social, and Reappraisal thought suppression strategies did not correlate with measures of psychopathology with any practical significance.

Two possibilities for the lack of such correlational evidence of convergent validity exists. First, it is possible that engagement in Distraction, Social, and Reappraisal thought suppression strategies are not indicative of positive or negative cognitive coping in adolescents (unlike the evidence found in adult samples). A second possibility is that a negative relationship to psychopathology could not be observed in the current study due to the lack of a clinical comparison sample. The absence of significant correlations with the Distraction, Social, and Reappraisal subscales is problematic for demonstrating adequate convergent validity for those subscales. Therefore scores on the Distraction, Social, and Reappraisal subscales should be interpreted with caution until future investigations are able to demonstrate evidence of their convergent validity, particularly by examining their psychometric properties in a clinical sample. Despite the lack of convergent validity for some subscales, the overall frequency of engagement in thought suppression as well as the maladaptive forms of suppression (i.e. Worry and Punishment) show adequate concurrent validity with measures of obsessions, worry, anxiety control, and internalizing symptoms and performed similarly to the psychometrics of the adult TCQ (see Wells & Davies, 1994).

Discriminant validity has not been assessed by any researcher investigating the psychometric properties of the adult TCQ and is therefore an important consideration when examining the construct validity of the adolescent adaptation. Initial evidence of the TCQ-A's concurrent validity indicates that broad thought suppression is related to internalizing symptomatology, as predicted by cognitive theories of psychopathology. However, it remains important to demonstrate the lack of associations to theoretically distinct psychopathology such as externalizing behaviors (i.e. delinquent behaviors and attention problems). Therefore, the TCQ-A total score and each subscale were examined for correlations to measures of

externalizing disorder symptomatology on the YSR. Results overwhelming suggested that no relationship existed between the two constructs, with the exception of a weak positive correlation between Worry thought control strategies and the attention problems subscale of the YSR. The weak relationship noted between Worry and attention problems was not unexpected given similar clinical presentations of inattention and pathological worry (Eysenck, Derakshan, Santos, & Calvo, 2007). Therefore, it appears that thought suppression indeed demonstrated adequate relationships to theoretically similar pathological constructs but that it was not related to all psychopathology. Also important to note is that problems with attention specifically, were not associated with thought suppression engagement, suggesting that low attentional resources due to executive functioning development or attention-related pathology, such as Attention-Deficit/Hyperactivity Disorder, did not appear to influence responding on the TCQ-A.

Lastly, criterion validity was considered when assessing the TCQ-A's overall construct validity. Due to the lack of a clinical comparison sample, clinical vs. non-clinical status predictions could not be assessed in the current investigation. Therefore, the TCQ-A's ability to predict non-clinical symptomatology endorsements was assessed to provide the best analog evidence of criterion validity. Due to theoretical expectations of thought suppression's relations to OCD and GAD, it was expected that total engagement in thought suppression, as well as maladaptive thought suppression strategies specifically (i.e. Worry and Punishment), would significantly predict obsessions and worries above neutral or adaptive thought control methods (i.e. Distraction, Social, and Reappraisal). The total frequency of engagement in thought suppression as well as both the Worry and Punishment strategies each predicted OCI-CV and PSWQ-C scores as expected. Generalized anxiety traits were significantly predicted by maladaptive thought suppression strategies only; thus, the constructs of the Worry and

Punishment subscales on the TCQ-A conform to previous theoretical conceptions from the adult TCQ. Further, the PSWQ-C regression model demonstrated that neutral or adaptive thought suppression strategies on the TCQ-A did not significantly predict worry symptomatology.

As expected obsessive-compulsive traits were also significantly predicted by Worry and Punishment thought suppression; however, the regression model also included Reappraisal thought control methods as a significant predictor, a finding that was not expected given theoretical conceptualizations of Reappraisal being an adaptive thought control strategy not typically associated with psychopathology. Despite theoretical expectations, it stands to reason that, particularly in a non-clinical sample, subclinical increases in OCD symptomatology are associated with adaptive thought control methods like reappraisal. In a non-clinical sample, engagement in Reappraisal thought control methods may be effective for reducing intrusive cognitions measured by the OCI-CV due to the absence of thought-action-fusion cognitive distortions (see Rachman & Safran, 1999). The increases in reappraisal techniques seen in this non-clinical sample may be due to minimal-to-mild beliefs in the validity of obsessional thoughts, thereby making engagement in reappraisal non-threatening to core beliefs. Clinical populations may reduce engagement in reappraisal strategies due to prominent and distorted beliefs in the validity of obsessional thoughts and the utility of compulsive acts via thought-action-fusion processes that are reduced in subclinical samples.

4.3 Limitations and Future Directions

While the psychometric analysis of the TCQ-C, overall, indicated adequate to good reliability and validity for the total measure, the current investigation was limited in several ways. The most notable limitation was the lower than expected internal consistencies for the individual subscales. The total scale achieved adequate internal reliability; however, only the

Distraction, Reappraisal, and Social subscales achieved adequate internal reliabilities, which severely limited the subsequent interpretation of the Worry and Punishment subscales. The punishment subscale in particular was comprised of only two items, which was likely reducing the internal consistency of that scale due to lack of repeated measurement of the construct. Additionally, there was evidence that the obtained sample potentially demonstrated a poor understanding of the concept of worry broadly, which may have contributed to poor reliability. The poor internal consistency of the PSWQ-C and the Worry subscale of the TCQ-A in the present sample suggested that the obtained sample broadly responded inconsistently for the concept of worry. Further evidence of poor worry concept was that the PSWQ-C achieved good internal consistencies in previous research (Chorpita et al. 1997; Pestle et al. 2008) and the present sample showed relatively consistent responding for measures of concepts other than worry. Additionally, the sample, overall, scored somewhat comparably to a clinical sample on the PSWQ-C (see Pestle et al. 2008); however, few substantial elevations on the Anxious/Depressed or Internalizing Problems subscales of the YSR were noted that would support such elevated reports of worry. The discrepant reporting of this sample on the YSR and PSWQ-C was indicative of over reporting of worry and suggested that lower than expected internal consistencies, particularly for the Worry and Punishment subscales of the TCQ-A may have been affected by sample characteristics. The TCQ-A reliability properties should therefore be considered preliminary until replication in other clinical and non-clinical samples can demonstrate more conclusive reasons for low internal consistency.

Beyond incomplete evidence of reliability, the conclusions from the current study are further limited by the uneven subscale composition created when editing the TCQ-A to improve its factor structure. The five-factor solution achieved with the 14-item version yielded

encouraging results that were equivalent to, if not, an improvement upon the adult TCQ; however, in its current form, the punishment subscale contains fewer items than the other TCQ-A subscales due to item 10's poor factor loading and subsequent removal. While unequal subscale composition is not a serious threat to the overall psychometric soundness of the measure, content validity for the punishment subscale may be lacking due to limited measurement. The punishment subscale also had the lowest correlation with the total score, further indicating a lack of adequate measurement and limited convergence with the broader construct of thought suppression. Future investigations should aim to revise the problem of asymmetrical subscale composition and the limited reliability and validity of the Punishment subscale by creating and testing replacement items.

Beyond problems of interpretability due to inadequate reliability and validity evidence for the Punishment subscale, the present examination is limited by the lack of comparison to a clinical sample of adolescents with internalizing disorders. The initial psychometric properties obtained herein are promising; however, being that a large proportion of research using the adult version of the TCQ has been performed using clinical samples, the lack of clinical psychometrics for the TCQ-A limits the utility and generalizability of the measure. Therefore, an important line of future research would be to confirm the reliability, validity, and factor structure of the TCQ-A within those adolescent clinical samples that are most likely to be the target of research utilizing the measure – namely specific phobias, OCD, GAD, PTSD, and depressive disorders. Likewise, the lack of concurrent validity evidence for the Distraction, Social, and Reappraisal subscales demands further investigation within clinical samples. Lastly, criterion validity, when predicting clinical status, should be examined as further evidence of validity properties.

Other sample characteristics, beyond clinical status, are problematic in generalizing findings from the current study, namely the gender distribution, the relative socioeconomic status, and the regional specificity of the sample. First, participants were obtained from educational institutions in which the socioeconomic demographics trend toward middle-to-high income households, limiting generalizability to adolescents from lower income backgrounds. Second, nearly a third of the sample was obtained from an undergraduate population, which limits the generalizability of the current findings. Including a convenience sample of adolescents from the undergraduate population ensured the current study was able to obtain the full age range of adolescents (i.e. 12yrs.-18yrs.). However, the disproportionately large undergraduate sample introduces confounds to the construct of “adolescence,” for which the TCQ-A is designed. Third, the obtained sample, was skewed toward females (approximately 68% female). There was no main effect of gender on TCQ-A total or individual subscale scores in the current sample despite the disproportionate sample composition. Similarly, the psychometric properties of the adult TCQ were stable when split by gender (Wells & Davies, 1994), and therefore it can be reasonable assumed that the gender distribution in the current sample would not meaningfully change the psychometric performance of the TCQ-A when extrapolating to other samples. Nevertheless, adolescent females are known to endorse internalizing symptomatology at greater rates than males (see Hankin & Abramson, 2001; Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998), and for that reason, the psychometric results herein should be interpreted with care when considering generalizability to adolescent male populations.

Once the psychometric properties of the TCQ-A can be replicated and extended to clinical samples, future research investigating the consequences and correlates of thought suppression engagement should be performed with the TCQ-A to mirror the adult literature. Of

particular interest would be including the TCQ-A in empirical investigations of cognitive and cognitive-behavioral models of psychopathology in adolescents. Most models of youth psychopathology, particularly internalizing disorders, have been developed using adult conceptualizations that have simply been assumed to downwardly extend to adolescents. An important and missing line of clinical research is to validate those models. In many cases, testing models of psychopathology in adolescents would include the variable of thought suppression, which was not previously measurable in adolescents due to the absence of an empirically derived and tested instrument such as the TCQ-A.

Lastly, the TCQ-A could have potential applications in clinical trials research for disorders like OCD, GAD, PTSD, and major depression. While, strictly speaking, the TCQ-A and the adult TCQ are not intended as measures of diagnostic symptomatology, treatment outcome research could be enhanced by investigating the cognitive effects that psychotherapies produce. The TCQ-A would be an interesting measure to include in youth outcome research, particularly considering the inclusion of a Reappraisal subscale, which outwardly appears to measure cognitive strategies seen in most cognitive and cognitive-behavioral therapies, such as thought challenging and probability estimation. The TCQ-A would not provide diagnostic outcome, but it would be able to offer at least initial evidence of direct cognitive change in treatments for youth, an area of research that has as of yet been particularly ignored in child and adolescent clinical trials. Thought suppression treatment effects (i.e. changes in strategy use from punishment at pre-treatment to distraction following treatment) in adult anxiety treatment has been demonstrated (Abramowitz et al., 2003; Reynolds & Wells, 1999). Similar investigations of changes in thought suppression engagement among adolescents would significantly further our knowledge of cognitive effects of treatments, as currently very little is

known regarding CBT's treatment efficacy for addressing the cognitive component of the anxious responses (see Davis, May, & Whiting, 2011).

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VITA

Reanna (Sara) E. Whiting was born Sarah E. Case in Mount Kisco, New York, along with her twin brother, Philip, to parents Dennis Case and Janet Whiting. Sadly, in 1993, her mother passed away suddenly from complications of diabetes. Sara spent most of her childhood engaging in passions for science and visual and dramatic arts. In the summer of 1999, Sara served as Maid of Honor to Debra Levy when her father and Debra were married on her grandparents' farm in Lebanon, New York. In 2002, she legally changed her name to both honor her late mother and to pursue an acting career.

Sara attended the University of San Francisco as a dual physics and drama major from 2002 to 2003; however, she subsequently transferred to Smith College in Northampton, Massachusetts. At Smith, Sara worked under the mentorship of Patricia DiBartolo, whom she credits with influencing her research interests in childhood anxiety. Sara graduated *cum laude* from Smith in 2006 majoring in psychology and minoring in education and child study. She then went on to work as a research assistant for the Massachusetts General Hospital's Pediatric Psychopharmacology Research Unit. In the summer of 2007, Sara became a research assistant at the Anxiety Disorders Center at Hartford Hospital, under the mentorship of David F. Tolin. Working with Doctor Tolin and his team led her to develop interests in childhood obsessive-compulsive disorder and treatment dissemination research. In 2009, Sara started the doctoral program in clinical psychology at the Louisiana State University where she currently studies childhood anxiety disorders under the mentorship of Thompson E. Davis III.