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A Psychometric Evaluation of the Thought Control Ability Questionnaire (TCAQ)
and the Prediction of Cognitive Control

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Running Head: thought control ability

Abstract

Study 1 evaluated the psychometric properties of the English version of the Thought Control Ability Questionnaire (TCAQ; Luciano, Algarabel, Tomás, & Martínez, 2005), an index of perceived control over intrusive cognitions. Confirmatory factor analysis in a sample of 720 University students revealed a clear uni-dimensional structure (after removal of items 5, 7, 8, 14, and 25) with high internal consistency ($\alpha = .87$, 95% CI = [.86, .88]) and test-retest reliability after a six month interval ($r = .68$). Correlational analyses supported an inverse relationship with measures of depression, anxiety, maladaptive cognitive control strategies, and obsessive–compulsive symptomatology. Study 2 tested the ability of the TCAQ to predict successful cognitive control during an experimental suppression protocol. Results demonstrated that weak thought control ability was predictive of the frequency and associated levels of distress of a target thought while under instruction to suppress. Additionally, weak perceived thought control ability was predictive of increased efforts to suppress the target material. Collectively, results suggest that thought control ability is a measurable individual difference variable and that the TCAQ is a reliable index of perceived cognitive control.

Key words: thought suppression, thought control ability, mental control, intrusive thoughts

Experimental evidence of the paradoxical effects of suppression first demonstrated by Wegner, Schneider, Carter, and White (1987) have been equivocal (see Abramowitz, Tolin, & Street, 2001 for a review). To account for the discrepant findings, some researchers have investigated underlying individual difference variables in cognitive control. For example, the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) was developed to index general or trait suppression tendencies while the Thought Control Questionnaire (TCQ; Wells & Davies, 1994) was developed to index the extent that individuals employ specific techniques to exert control over unwanted thoughts. Although the WBSI is perhaps the most widely used measure in the literature, it has recently been criticized for its psychometric properties. Specifically, the measure was designed to tap a unidimensional construct of chronic or trait thought suppression, but subsequent validation (Blumberg, 2000; Höping & de Jong-Meyer, 2003; Rassin, 2003) has revealed a factor structure more consistent with at least two factors - the measurement of unwanted intrusions and the measurement of suppression efforts. These two factors have demonstrated differential relationships to indices of psychopathology (specifically, the unwanted intrusion factor positively correlated with indices of depression and anxiety, whereas the suppression factor did not). Accordingly, Höping and de Jong-Meyer (2003) suggested it would be important to distinguish between these two constructs in the thought control literature, especially when attempting to relate findings to the clinical literature. In fact, Rassin (2003) found a similar two-factor solution in both a student and a clinical sample of mixed anxiety and mood disorder patients and reported that the intrusion-factor items inflated the correlation between the WBSI and Obsessive-Compulsive complaints (Maudsley Obsessive-Compulsive Inventory (MOCI); Hodgson & Rachman, 1977).

As also noted by Rassin (2003), some of the WBSI items simultaneously tap both intrusions and suppression efforts (e.g., *“I have thoughts that I try to avoid”*). As a result, efforts to disentangle the two constructs are not straightforward, as low scores could indicate either successful suppression efforts or the absence of intrusions to suppress. The importance of measuring successful suppression has recently been elaborated by Luciano et al. (2005). These authors developed a specific self-report questionnaire to measure individual differences in the perceived ability to suppress unwanted intrusions. The Thought Control Ability Questionnaire (TCAQ; Luciano et al., 2005) was therefore designed to capture variance in an individual’s ability to exert control over unwanted intrusions as a uni-factorial construct and, further, to potentially account for the reported differences in rebound and enhancement effect observed in suppression studies. The 25-item TCAQ contains items such as *“I manage to have control over my thoughts even when under stress”* and reverse-scored items such as *“Frequently, some thoughts or images take over my mind”*. Scores range from 25-125, with higher scores reflecting greater perceived mental control over intrusions. An exploratory factor analysis in 211 Spanish students initially revealed a five-factor solution although the authors reported a one-factor solution more appropriately fit the data. The one-factor solution, representing perceived ability to control one’s intrusions, demonstrated high internal consistency (Cronbach’s alpha = .92) and good test-retest reliability ($r = .88$). Additionally, as proposed by the authors, the TCAQ demonstrated an inverse relationship to measures of psychopathology including trait anxiety, depression, worry, obsessive compulsive symptomatology, and maladaptive thought control techniques even after partialling out anxious and neurotic symptoms. Furthermore, thought control ability accounted for unique variance in the prediction of these measures after controlling for scores on

the WBSI and the TCQ, suggesting incremental value of the TCAQ beyond that captured by traditional measures of mental control.

Gay, d'Acremont, Schmidt, and Van der Linden (2008) recently conducted an evaluation of a French version of the TCAQ in a sample of 254 undergraduate French-speaking students. A clear uni-factorial solution was found after the removal of items 5 and 8. The English version of item 5 is 'I constantly censure my thoughts and actions'; the wording of item 8 is 'I constantly evaluate whether my thoughts and actions are appropriate'. The authors noted that these two items make reference to behaviour control and may therefore contaminate responses that ought to be based on pure cognitive control.

Although these findings suggest that the TCAQ may be an additional measure relevant to the field of thought suppression research, the findings are nonetheless preliminary and require replication. Specifically, because the original inventory was developed and validated in a Spanish sample, and has subsequently been validated in a French sample, analysis of its properties in an English-speaking sample is particularly warranted. Additionally, as indicated by Luciano et al. (2005), if the TCAQ adequately measures successful thought control ability, then TCAQ scores should function as a predictor of the paradoxical effects of suppression. Namely, individuals who measure low on this inventory (that is, have weak perceived mental control ability) should be more prone to experience suppression failures and associated distress when under instruction to suppress compared to those who measure high on this inventory (Luciano et al., 2005).

This paper outlines two studies. The goal of Study 1 was to evaluate the psychometric properties of the TCAQ in a large English-speaking sample. The goal of Study 2 was to experimentally test the hypothesis that weak perceived cognitive

control would be predictive of suppression failures and associated distress when under instruction to suppress.

Study 1: Factor Structure and Reliability of the TCAQ

Method

General Sample Characteristics

A university sample of 484 females and 236 males with a mean age of 19.46 ($SD = 3.28$, range 17-56) completed the TCAQ. All participants were recruited from the first year Psychology subject pool of the University of New South Wales and participated in exchange for course credit. As data were compiled from multiple research projects within our lab, additional analyses are reported in the relevant sub-samples.

Measures

Thought Control Ability Questionnaire (TCAQ; Luciano et al., 2005). The TCAQ is a 25-item self-report questionnaire described above. The Spanish version of the TCAQ was translated into English by a professional bilingual translator and then back-translated into Spanish by a different professional bilingual translator. No discrepancies were apparent between the two versions (Luciano, personal communication, 2008). For the English version respondents rate on a five-point Likert-type scale the extent to which they agree with each statement (1 = completely disagree; 2 = somewhat disagree; 3 = neither agree nor disagree; 4 = somewhat agree; 5 = completely agree). Initial psychometric information for this measure is reported above.

Obsessive Compulsive Inventory- Revised (OCI-R; Foa, Huppert, Leiberg, Langner, Kichic, Hajcak, et al., 2002) is an 18-item self-report inventory of obsessive-

compulsive symptomatology. The subscales include Washing, Checking/Doubting, Obsessing, Mental neutralizing, Ordering and Hoarding. Internal consistency (Cronbach's alpha) for the Total score is .90 (Foa et al., 2002). Total scores range from 0-72.

Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a self-report questionnaire that indexes symptoms of depression, anxiety, and stress over the past week. The DASS-21 possesses good validity, internal consistency, and concurrent validity (Antony, Bieling, Cox, Enns, & Swinson, 1998). The total score is multiplied by 2 to equate to the full 42-item version. Scores range from 0-42.

Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988). The BAI was designed to reduce the overlap between depression and anxiety by measuring anxiety symptoms shared minimally with those of depression. It consists of 21-items that tap physiological and cognitive components of anxiety. Cronbach's alpha has been reported as .92 (Beck et al., 1988).

Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report inventory that measures symptoms of depression. The BDI possesses high internal consistency, with alpha coefficients of .86 and .81 for psychiatric and non-psychiatric populations, respectively (Beck et al., 1996).

White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994). The WBSI is a 15-item self-report questionnaire that measures chronic thought suppression tendencies, or the deliberate attempt to avoid thinking about unpleasant thoughts. The authors report good internal consistency and test-retest reliability (alpha .89 and .80, respectively). Following the suggestion of Höping and de Jong-Meyer (2003), Intrusion and Suppression subscale scores were also calculated in this study. The

authors report good internal consistency and test-retest reliability (alpha .89 and .80, respectively). Scores on the Total scale range from 15-75.

Thought Control Questionnaire (TCQ; Wells & Davies, 1994). The TCQ is a 30-item self-report questionnaire developed to index individual differences in control of unpleasant or unwanted intrusions through various thought management strategies. The subscales include Reappraisal, Distraction, Punishment, Social Control, and Worry with Cronbach's alpha values for the subscales of .66, .78, .66, .67, and .74, respectively (Reynolds & Wells, 1999). Scores on each subscale range from 6 to 24.

Results

Confirmatory Factor Analysis (CFA) of the TCAQ

Given that preliminary studies found that the TCAQ was uni-dimensional (Gay et al., 2008; Luciano et al., 2005), we decided to use confirmatory factor analytic approach considering that sufficient knowledge has accumulated to formulate a uni-dimensional model of the TCAQ. We tested this model with a CFA using the 'SEM' package of R (R Development Core Team, 2007). Model fit was evaluated with the Root Mean Square Error of Approximation (*RMSEA*; Steiger, 1990) and the Standardized Root Mean Square Residual (*SRMR*; Bentler, 1995). When compared with other fit indexes, the *RMSEA* and the *SRMR* present the advantage of being less sensitive to small misspecifications of the factor structure that are very common in the domain of personality research (Beauducel & Wittmann, 2005). A *RMSEA* between 0 and 0.05 indicates a good fit, and values between 0.05 and 0.08 an acceptable fit; an *SRMR* between 0 and 0.05 indicates a good fit, and values between 0.05 and 0.10 an acceptable fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Analysis resulted in a significant chi-square (χ^2 (275, $N = 720$) = 1463.74; $p < .001$), a *RMSEA* of 0.077,

and an *SRMR* of 0.071, but revealed that 5 standardized loadings were less than .40 (items 5, 7, 8, 14, and 25, see Table 1). Further examination of the inter-item correlation matrix revealed that these items failed to correlate significantly with one another. We therefore choose to remove these items for the English version of the TCAQ. A CFA on the reduced inventory resulted in a significant chi-square (χ^2 (170, $N = 720$) = 942.98; $p < .001$), a *RMSEA* of 0.079, and an *SRMR* of 0.061. According to the above-mentioned criteria, these two latter indices suggest an acceptable fit for the uni-dimensional model of the English TCAQ. In addition, the reliability of the latent factor (proportion of observed variance not due to measurement error) was good (.86).

TCAQ and Gender

Females scored slightly but significantly lower on the TCAQ than males with average scores of 57.27 ($SD = 13.30$) and 59.83 ($SD = 13.49$), respectively, $t(718) = -2.40$, $p = .02$.

 Insert Table 1 about here

Discussion

Reliability of the TCAQ

Internal reliability was also assessed by computing the Cronbach coefficient with its CI (see McGraw & Wong, 1996). Internal consistency of the TCAQ was .88, 95% CI = (.87, .89) and was thus very similar to reliability of the latent factor (.86). In addition, the test-retest reliability coefficient for a sub-sample of 62 participants (45 female) administered the TCAQ after six months was good, $r = .68$, $p < .001$. The mean score in this sub-sample was 60.32 ($SD = 15.68$) at first administration

(Cronbach's alpha = .91) and was 59.07 ($SD = 15.91$) after the six month interval (Cronbach's alpha = .92)

Relationship with Indices of Psychopathology and Thought Control

Pearson r correlations were computed between the TCAQ and measures of general psychopathology (DASS), depression (BDI-II), anxiety (BAI), obsessive-compulsive symptoms (OCI-R), intrusion and suppression of thoughts (WBSI), and thought control strategies (TCQ). The means and standard deviations for these measures and the subscale scores are reported in Table 2 along with the correlation coefficients. Results were consistent with the findings of Luciano et al. (2005) who reported a strong inverse relationship between high thought control ability and similar measures of psychopathology. Not surprisingly, the highest correlations were observed between thought control ability and obsessional thinking, depression, anxiety, and thought intrusiveness.

Insert Table 2 about here

The first goal of the current investigation was to evaluate the psychometric properties of the English version of the TCAQ (Luciano et al., 2005). Confirmatory factor analysis revealed five items (5, 7, 8, 14, 25) that either failed to meet the minimal loading criterion or demonstrated non-significant inter-item correlations. The English version of item 5 is 'I constantly censure my thoughts and actions'; the wording of item 8 is 'I constantly evaluate whether my thoughts and actions are appropriate'. Gay, d'Acremont, Schmidt, and Van der Linden (2008) recently conducted an evaluation of a French version of the TCAQ and reported similar

results. Consistent with our findings for these two items, in a sample of 254 undergraduate French-speaking students, Gay et al. (2008) found a clear uni-factorial solution after the removal of items 5 and 8. The authors noted that these two items make reference to behaviour control and may therefore contaminate responses that ought to be based on pure cognitive control. Item 7, ‘I am usually successful when I decide not to think about something’ was also problematic. The wording of this item is confusing and may account for its poor performance. Item 14, ‘There are few things in life that manage to trouble me’ and item 25 ‘I have much patience, and I do not lose my composure easily’ were also dropped from the final inventory. These items do not appear to specifically capture mental control and are considered too broad in scope.

The reduced 20-item inventory demonstrated good reliability and correlated with other indices of psychopathology as expected. To provide further evidence of the validity of this measure, we sought to demonstrate the predictive validity of the TCAQ during an experimental suppression task.

Study 2: TCAQ and the Prediction of Successful Suppression

To assess the validity of the TCAQ to distinguish successful and unsuccessful suppressors, an experimental suppression protocol was carried out. Suppression efforts, even by non-clinical populations prone to utilize this cognitive strategy, are likely to be cyclical in nature. Wegner (1989) introduced the notion of indulgence cycles to capture this cyclic quality and to refer to periods of repeated suppression attempts followed by opportunities for expression in the escalation of obsessional thoughts. Recent studies investigating a range of intrusive cognitions (Hardy &

Brewin, 2005; Williams & Moulds, 2007) have begun to assess the effects of repeated suppression on intrusion characteristics, therefore Study 2 assessed the ability of the TCAQ to predict successful suppression across a series of suppression and monitor conditions. We hypothesized that weak perceived thought control ability (low TCAQ scores) would predict higher frequency and associated distress of a self-relevant target thought in addition to suppression efforts when under instruction to suppress.

Method

Participants

Forty eight females and 23 males with a mean age of 19.63 years ($SD = 2.24$) participated in exchange for partial course credit in first year Psychology at The University of New South Wales.

Measures

Thought Control Ability Questionnaire (TCAQ; Luciano et al., 2005). The reduced 20-item TCAQ described in Study 1 was used to index perceived cognitive control. Internal consistency was .91 in the current sample.

Obsessive Compulsive Inventory- Revised (OCI-R; Foa et al., 2002). The OCI-R is an 18-item self-report inventory of obsessive-compulsive symptomatology described in Study 1.

Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a self-report questionnaire that indexes symptoms of depression, anxiety, and stress described in Study 1.

Procedure

The experimental protocol was based on a standard thought suppression procedure (Wegner et al., 1987), but employed a modified target prompt similar to

that used by Rassin (2001) in which the experimenter asked the participant to imagine a specific tragic event happening to a loved one. In the current study participants completed all questionnaires on a computer using MedialabTM. Participants completed the OCI-R, DASS, and were then instructed to type the name of a loved one in the space provided. The subsequent computer screen embedded the loved-one's name in the following sentence '*Now imagine that (loved one's name) has been in a car accident*'. This information was presented on the computer screen for 30 seconds and then participants were informed that this would be their 'target thought'. This methodology has been successfully piloted in Grisham and Williams (2009). Following exposure to the target thought, participants completed the experimental tasks which consisted of a baseline monitoring period followed by two cycles of suppression and monitor only periods (each lasting for three minutes). The instructions were adapted from Salkovskis and Campbell (1994) and are outlined below:

Baseline and Monitor Condition Instructions: During the few minutes, you may think about anything you like. You may think about the accident target thought, but you do not have to. If at any time you think of the accident target thought please press the X key for each occurrence. It is important that you continue in the same way for the full duration.

Suppression Condition Instruction: During the next few minutes, please record your thoughts as you did before. It is very important that you try as hard as you can to suppress the accident target thought, but be sure to press the X key if you do think of the accident target thought. It is important that you continue in the same way for the full duration.

Keyboard presses were recorded in Microsoft Excel file that was not visible or accessible to participants. Subsequent to each experimental condition participants

rated their level of distress and natural efforts to suppress the target thought (0 = ‘not at all distressing’ – 100 = ‘extremely distressing’ and 0 = ‘not at all trying to suppress’ – 100 = ‘trying extremely hard to suppress’, respectively). This protocol resulted in the following measurements: frequency at time 1, 2, distress at time 1, 2, and suppression efforts at time 1, 2.

Results

Casewise diagnostics revealed that several observations ($n = 5$) had a standardized residual greater than three standard deviations from the regression line. Outliers were therefore removed from their respective analyses and separate regression analyses were used to examine the hypotheses that perceived thought control ability (TCAQ) would predict unique variance in the frequency and associated distress of the target thought and suppression efforts when under instructions to suppress, even after controlling for obsessive compulsive symptoms (OCI-R) and general psychopathology (DASS). Due to the difference in TCAQ scores observed between males and females in Study 1, we also investigated the potential moderating influence of gender. Prior to inclusion in the regression all variables were mean centered. The OCI-Rc and DASSc were entered as predictors in the first step, TCAQc was entered in the second step, and gender was entered in the third step followed by the product term of the TCAQc and gender in the fourth step.

Table 3 reports the results of each separate regression analyses for all dependent variables (frequency: time 1, 2; distress: time 1, 2; suppression efforts: time 1, 2). Notably, TCAQ scores accounted for significant variance in frequency at time 1 and at time 2, in distress ratings at time 1 and at time 2, and in suppression efforts at time 1 and at time 2 (see Table 3). The main effect of gender and the product term

representing the interaction were non-significant (p 's > .05), with the exception of a marginally significant ($p = .045$) interaction effect on suppression efforts at time 1. In order to interpret the interaction effect, variables were entered into the Interaction[©] (Stoper, 2009) program for analysis. Results indicated that during the first suppression phase, when perceived thought control ability was low males reported greater efforts to suppress than females. In comparison, when perceived thought control ability was high females reported greater efforts to suppress.

 Insert Table 3 about here

Finally, correlations were computed to replicate the findings from Study 1; namely, the inverse relationship between TCAQ and general psychopathology (DASS) and obsessive-compulsive symptomatology (OCI-R). TCAQ scores were significantly correlated with DASS scores ($r = -.62$) and OCI-R scores ($r = -.49$), p 's < .001.

General Discussion

The current investigation evaluated the psychometric properties of the English version of the Thought Control Ability Questionnaire (TCAQ; Luciano et al., 2005). After the removal of five items (5, 7, 8, 14, 25) confirmatory factor analysis in a sample of 720 University students revealed a clear uni-dimensional structure with good internal consistency and test-retest reliability. The results of the correlational analyses were highly consistent with the original Spanish findings. Luciano et al. (2005) suggested that thought control disability could represent an index of emotional vulnerability and reported an inverse relationship with measures of depression, worry, guilt, and obsessive-compulsive symptoms and a positive relationship with adaptive

thought control strategies after partialling out trait anxiety and neuroticism. Our results replicated these relationships by demonstrating highly significant correlations between the TCAQ and similar measures of psychopathology.

In regards to the relationship between the TCAQ and the TCQ, it is noteworthy that endorsement of the Punishment and Worry subscales have been associated with more severe symptoms across a range of disorders (e.g., Amir, Cashman, & Foa, 1997; Andrews, Troop, Joseph, Hiskey, & Coyne, 2002), whereas endorsement of the Social Control subscale has been considered as an adaptive control strategy (Harvey, 2001; Wells & Davies, 1994). In the current study, weak perceived mental control ability was correlated with the use of worry and punishment as control strategies, but was uncorrelated with social control. TCAQ scores were however positively correlated with the TCQ Distraction subscale. Luciano et al. (2005) noted that this association aligns with clinical findings, as distraction has been linked to decreases in obsessional symptoms after treatment with exposure and response prevention (Abramowitz, Whiteside, Kalsy, & Tolin, 2003). Distraction may be an effective or an ineffective strategy depending on its application. Wegner (1989) proposed that suppression using unfocused distraction could lead to a subsequent increase in the occurrence of suppressed thoughts, but that focused distraction could lessen thought reoccurrence. Abramowitz et al., (2003) suggested that the use of distraction may be adaptive to the extent that such strategies promote accurate appraisals of intrusions as harmless and do not lead to misinterpretations of the meaning or consequences of intrusions. The employment of punishment and worry as thought control strategies however are argued to promote misinterpretations and associated intrusion distress (Abramowitz et al., 2003). The current findings suggest that even non-clinical populations employ maladaptive mental control strategies, and

further, that holding beliefs about the ability to exert control over unwanted cognitions is related to the employment of these maladaptive strategies.

The second aim of the current study was to extend the evaluation of the TCAQ to the experimental domain. Luciano et al. (2005) suggested that individuals who measure low on the TCAQ should be more prone to experience paradoxical effects during a suppression task compared to those who measure high on this inventory. To test this hypothesis, we devised a modified suppression protocol to assess the effects of repeated suppression and opportunities for expression by using a method to index the frequency, associated levels of distress, and suppression efforts of a negative target thought and observed whether effects were differentially linked to thought control ability. Results revealed that weak perceived thought control ability was indeed predictive of the frequency and associated levels of distress of intrusions experienced when under instruction to suppress. Additionally, weak perceived thought control ability was associated with increased efforts to suppress the target material.

These results can be considered in the context of recent cognitive control models of OCD. Clark and Purdon (Clark, 1989; Clark, 2004; Clark, 2006; Clark & Purdon, 1993; Purdon & Clark, 1999) suggested that beliefs and appraisals about the need to exert control over one's thoughts, combined with maladaptive beliefs about the consequences of failures in thought control may play a role in the pathogenesis of obsessions. Clark (2006) notes that simply holding such beliefs may lead to greater distress and intrusion reoccurrence than engaging in forms of cognitive control in isolation as these beliefs will direct increased amounts of attention to the intrusion. In this way, primary appraisals of the meaning of intrusions and secondary appraisals of the need for thought control and of the consequences of thought control failures result in the employment of control strategies which are typically ineffective, thereby

resulting in failed thought control, reoccurrence of the unwanted cognitions, and heightened distress (Clark, 2004; 2006). Perceived thought control ability may represent an additional secondary appraisal that fuels this cycle. Future research would benefit from incorporating measurement of perceived thought control ability with assessments of metacognitive beliefs about the need to exert control over one's thought and the consequences of failed thought control in order to conceptualize how these beliefs may interact.

The findings from the current study need to be considered in light of several limitations. The psychometric analysis of the TCAQ was conducted in a non-clinical sample, therefore conclusions regarding perceptions of mental control ability by clinical, and particularly OCD populations, cannot be made. In addition, although the findings support the validity of the TCAQ as an index of thought control ability, it is possible that reporting bias across the experimental conditions influenced the results. Participants may have underreported the frequency and their suppression efforts when instructed to suppress, and similarly inflated their ratings of frequency and suppression efforts when under instruction not to suppress. It is noteworthy that the TCAQ not only predicted the frequency of intrusions and suppression efforts, as would be expected, but also predicted levels of associated distress across each experimental condition. The consistency in these findings provides support for the validity of the TCAQ beyond reporting bias.

Although differences in TCAQ scores across gender were observed in Study 1, this marginal difference did not appear to influence actual suppression success during the experimental protocol. Results of Study 2 did not indicate a main effect of gender on the reported frequency or associated distress of target intrusions during either of the suppression phases. In addition, gender did not moderate the effect of perceived

cognitive control on the frequency or associated distress of target thoughts, but may have had an impact on actual suppression efforts reported during the first suppression phase. When perceived thought control ability was low males reported greater efforts to suppress than females, possibly suggesting that the female participants in this sample relied on other thought control strategies when instructed to suppress. Future research could investigate differences in the type of strategies employed across gender.

Collectively the findings suggest that perceived thought control ability is a measurable individual difference variable and that the TCAQ is a reliable index of this construct, although research with clinical populations is clearly needed in order to substantiate the utility of the TCAQ as a potential clinical measure.

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Table 1

Items, corrected item-total correlations (*rtot*) and standardized loadings (based on CFA) of the Thought Control Ability Questionnaire (TCAQ)

Items	<i>rtot</i>	Std Loading
1 It is often difficult for me to fall asleep because my mind keeps going over personal problems ^a	0.49***	0.46**
2 I often cannot avoid having upsetting thoughts ^a	0.69***	0.68**
3 Although some people criticize me unfairly, I can't help thinking they might be right ^a	0.56***	0.53**
4 I manage to have control over my thoughts even when under stress	0.52***	0.49**
5 I constantly censure my thoughts and actions ^{a b}		
6 Any setback overwhelms me, no matter how small ^a	0.57***	0.54**
7 I am usually successful when I decide not to think about something ^b		
8 I constantly evaluate whether my thoughts and actions are appropriate ^{a b}		
9 It is very easy for me to stop having certain thoughts	0.47***	0.44**
10 I feel worried, frustrated or sad for a long time after having an embarrassing, troublesome or painful experience ^a	0.58***	0.54**
11 It is easy for me to free myself of troublesome thoughts	0.58***	0.55**
12 Frequently, some thoughts or images take over my mind ^a	0.58***	0.56**
13 There are negative things in my past that I cannot help remembering ^a	0.50***	0.46**

14 There are few things in life that manage to trouble me ^b		
15 I haven't been able to get the argument I had with (my partner, my parents, a friend...) out of my head for several days ^a	0.48***	0.42**
16 I consider myself a person who is good at controlling positive and negative emotions	0.59***	0.56**
17 My thoughts control me more than I control them ^a	0.51***	0.49**
18 There are some thoughts that enter my head without me being able to avoid it ^a	0.59***	0.59**
19 My thoughts are uncontrollable ^a	0.66***	0.66**
20 I am not usually overwhelmed by unpleasant thoughts	0.50***	0.46**
21 I am unable to free myself from certain thoughts: e.g. "I am a failure", "I am useless", "I am no good at all", etc ^a	0.53***	0.50**
22 I think other people have more control over their thoughts than I do ^a	0.63***	0.61**
23 If I get angry or fight with someone, I can't stop thinking about it, and I can hardly work or concentrate ^a	0.63***	0.60**
24 I get rid of uncomfortable thoughts or images almost effortlessly	0.52***	0.49**
25 I have much patience, and I do not lose my composure easily ^b		

Note: ^a Reverse scored items; ^b Item removed from final 20-item TCAQ. * $p = .05$; ** $p < .01$, *** $p < .001$; $N = 720$.

Table 2
Means and Standard Deviations (SD) for study questionnaires and correlations with the Thought Control Ability Questionnaire (TCAQ)

	N	M	(SD)	<i>r</i> TCAQ
OCI-R	165	13.60	(9.61)	-.51**
OCI-R Obsessing	165	2.51	(2.76)	-.65**
OCI-R Washing	165	1.06	(1.60)	-.26*
OCI-R Checking	165	2.18	(2.29)	-.37**
OCI-R Hoarding	165	3.44	(2.82)	-.30**
OCI-R Neutralizing	165	1.04	(1.42)	-.18*
OCI-R Ordering	165	2.88	(2.40)	-.30**
BAI	165	8.92	(8.04)	-.48**
BDI-II	97	14.98	(10.09)	-.35**
DASS	272	27.05	(17.39)	-.27**
WBSI Total	272	44.91	(12.55)	-.47**
WBSI Intrusion	272	26.65	(8.31)	-.50**
WBSI Suppression	272	18.25	(5.44)	-.33**
TCQ Total	272	62.49	(9.30)	-.12*
Distraction	272	15.01	(3.55)	.17**
Social Control	272	13.98	(4.09)	.01
Worry	272	10.04	(3.01)	-.32**
Punishment	272	9.82	(2.59)	-.32**
Reappraisal	272	13.66	(3.40)	-.01

Note. OCI = Obsessive–Compulsive Inventory - Revised; BAI = Beck Anxiety Inventory ; BDI-II = Beck Depression Inventory Second Edition; DASS = Depression, Anxiety, Stress Scale; WBSI = White Bear Suppression Inventory; TCQ = Thought Control Questionnaire.

* $p < 0.05$; ** $p < 0.00$

Table 3

Hierarchical regression analyses for target frequency, distress, and suppression efforts across experimental conditions (Time 1, 2)

Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ² Change
Frequency 1				
Step 1 <i>F</i> (2, 63) = .46				.02
OCI-R	.02	.03	.12	
DASS	.01	.01	.04	
Step 2 <i>F</i> (1, 62) = 7.21**				.10
TCAQ	-.06	.02	-.42**	
Step 3 <i>F</i> (1, 61) = 1.54				.02
Gender	-.66	.54	-.15	
Step 4 <i>F</i> (1, 60) = .42				.01
Gender x TCAQ	.02	.03	.13	
Distress 1				
Step 1 <i>F</i> (2, 67) = 5.87**				.14
OCI-R	.88	.41	.27	
DASS	.27	.20	.17	
Step 2 <i>F</i> (1, 66) = 4.37*				.05
TCAQ	-.69	.33	-.30*	
Step 3 <i>F</i> (1, 65) = 1.96				.02
Gender	10.81	7.71	.16	
Step 4 <i>F</i> (1, 64) = 1.71				.02
Gender x TCAQ	.68	.52	.24	
Suppression 1				
Step 1 <i>F</i> (2, 67) = 2.08				.05
OCI-R	.41	.48	.11	
DASS	.28	.23	.16	
Step 2 <i>F</i> (1, 66) = 5.54*				.07
TCAQ	-.90	.38	-.36*	
Step 3 <i>F</i> (1, 65) = .08				.00
Gender	2.58	9.02	.03	
Step 4 <i>F</i> (1, 64) = 4.17*				.05
Gender x TCAQ	1.22	.60	.39* ^a	
Frequency 2				
Step 1 <i>F</i> (2, 63) = 1.96				.05
OCI-R	.01	.02	.02	
DASS	.01	.01	.23	
Step 2 <i>F</i> (1, 62) = 6.77**				.09
TCAQ	-.04	.02	-.39**	
Step 3 <i>F</i> (1, 61) = .71				.01
Gender	-.31	.36	-.10	
Step 4 <i>F</i> (1, 60) = .05				.00

Gender x TCAQ	-.01	.02	-.04	
<hr/>				
Distress 2				
Step 1 $F(2, 67) = 6.63^{**}$.16
OCI-R	.48	.30	.20	
DASS	.32	.15	.27	
Step 2 $F(1, 66) = 3.70^{*a}$.04
TCAQ	-.48	.25	-.28 ^{*a}	
Step 3 $F(1, 65) = .19$.00
Gender	-2.54	5.84	-.05	
Step 4 $F(1, 64) = .15$.00
Gender x TCAQ	.15	.40	.08	
<hr/>				
Suppression 2				
Step 1 $F(2, 67) = 3.59^{**}$.09
OCI-R	.36	.47	.11	
DASS	.43	.23	.24	
Step 2 $F(1, 66) = 12.85^{**}$.15
TCAQ	-1.3	.36	-.52 ^{**}	
Step 3 $F(1, 65) = .16$.00
Gender	-3.38	8.33	-.05	
Step 4 $F(1, 64) = 1.38$.01
Gender x TCAQ	.66	.57	.21	
<hr/>				
<i>Note.</i> * $p < .05$, ** $p < .01$, $p^{*a} = .05$				