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RELATIONSHIPS AMONG THOUGHT SUPPRESSION, INTRUSIVE THOUGHTS, AND PSYCHOLOGICAL SYMPTOMS

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Abstract

Although thought suppression is related to increases in psychological symptoms (Purdon, 1999), the mechanisms that may explain this relationship are not well understood. As a result, the current study examined the relationships among thought suppression, intrusive thoughts, and psychological symptoms assessed by the Personality Assessment Inventory (PAI) in a diverse sample of undergraduate students. Results suggested that, for women, utilizing thought suppression and experiencing unwanted intrusive thoughts were related to symptoms on the PAI. Findings further suggested that intrusive thoughts mediated the relationship between thought suppression and various psychological symptoms that may be experienced by women. In contrast, for men, intrusive thoughts mediated the relationship between thought suppression and psychological symptoms consistent with anxiety-related disorders. Results suggested that learning to accept the experience of unwanted thoughts and refraining from using thought suppression may promote more beneficial outcomes for individuals experiencing a variety of psychological symptoms.

Keywords: thought suppression, unwanted intrusive thoughts, psychological symptoms

Research has suggested that individuals' attempts to suppress their thoughts are related to their experience of psychological symptoms (Abramowitz, Tolin, & Street, 2001; Wenzlaff & Wegner, 2000). In fact, this relationship was noted for symptoms of Obsessive-Compulsive Disorder (Purdon, 2004), Depression (Dalgleish & Yiend, 2006; Rosenthal, Cheavens, Compton, Thorp, & Lynch, 2005; Rude & McCarthy, 2003; Van der Does, 2005), Borderline Personality Disorder (Rosenthal et al., 2005), Alcohol Abuse (e.g., Klein, 2007), and suicidal ideation (Najmi, Wegner, & Nock, 2007), with a higher reliance on thought suppression being related to an increased experience of psychological symptoms. Such relationships were consistent with the finding that cognitions

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(e.g., preoccupation with certain thoughts) play an important role in most psychological disorders and addictions (e.g., Beck, Gudmundsdottir, Palyo, Miller, & Grant, 2006; Borton, Markowitz, & Dieterich, 2005; Purdon, 1999, 2004; Riskind & Williams, 2005; Wenzlaff & Luxton, 2003). Although these relationships were documented, potential explanations for how thought suppression is related to psychological symptoms are not yet noted. As a result, this study examined one potential mediator, intrusive thoughts, in an attempt to explain the relationship between thought suppression and psychological symptoms.

In fact, the original research identifying individuals' difficulties with thought suppression alluded to intrusive thoughts as a potentially important explanatory variable. Wegner, Schneider, Carter, and White (1987) were the first to document experimentally that individuals have great difficulty suppressing their thoughts. In their seminal study, these researchers instructed participants to suppress thoughts about a white bear. Not only were participants unsuccessful at suppressing completely the target thought (i.e., the white bear), participants also reported a rebound (i.e., an increase) in target thoughts after a designated suppression period (Wegner et al., 1987). This rebound in target thoughts may mimic the intrusive thoughts that occur for those who experience psychological symptoms. Further, individuals' ability to suppress their thoughts can be compromised when their cognitive resources are taxed (Abramowitz et al., 2001; Wegner, 1994; Wegner & Erber, 1992; Wegner et al., 1987; Wenzlaff & Wegner, 2000), such as when intrusive thoughts are occurring. Purposeful thought suppression appears to be an ineffective method of controlling unwanted thoughts (e.g., Rassin, Muris, Jong, & de Bruin, 2005; Wegner et al., 1987). Thus, an inability to suppress thoughts may be related to the experience of intrusive thoughts and a subsequent worsening of psychological symptoms.

Intrusive thoughts and psychological symptoms also may be related closely. For example, many disorders, such as Somatization Disorder, may include anxious ruminations as a component of their presentation (American Psychological Association, 2000). Individuals may experience unwanted intrusive thoughts that are racing, impulsive, and grandiose when they are experiencing manic processes or that are delusional or paranoid when they are experiencing psychotic processes (American Psychological Association, 2000). In further support of the relationships among thought suppression, intrusive thoughts, and psychological symptoms, two recent studies demonstrated that college students may experience more auditory illusions (e.g., hearing specific words when listening to brown/white noise) when asked to suppress certain thoughts (Garcia-Montes, Perez-Alvarez, & Fidalgo, 2003; Rassin & van der Heiden, 2006). Further examination of these relationships is likely important, as individuals' attempts to utilize thought suppression may be related to increases in intrusive thoughts (Wegner et al., 1987) and, subsequently, to increases in their respective psychological symptoms.

Given these relationships, the experience of intrusive thoughts, which signifies an inability to suppress thoughts effectively, may be related more highly to psychological symptoms than simply the act of suppression alone (Höping & de Jong-Meyer, 2003). Wegner and Zanakos (1994) developed the White Bear Suppression Inventory (WBSI) to assess individuals' use of thought suppression. Recent studies, however, suggested that the WBSI may include multiple factors, with two- and three-factor structures being demonstrated (Blumberg, 2000; Höping & de Jong-Meyer, 2003; Rassin, 2003). Nonetheless, researchers agreed that the WBSI total score measures both individuals' engagement in thought suppression and their failed suppression attempts (i.e., intrusive thoughts; Blumberg, 2000; Höping & de Jong-Meyer, 2003; Rassin, 2003). Research further noted that the Thought Suppression subscale of the WBSI correlates positively and significantly with symptoms of Depression but not to symptoms of Anxiety and Obsessive-Compulsive Disorder. In contrast, the Unwanted Intrusive Thoughts subscale of the WBSI correlates positively and significantly with symptoms of Depression, Anxiety, and Obsessive-Compulsive Disorder (Höping & de Jong-Meyer, 2003). Researchers using Blumberg's (2000) three-factor structure of the WBSI also reported similar correlations between individuals' scores on the Thought Suppression and Unwanted Intrusive Thoughts subscales and their report of depressive symptoms. Overall, Blumberg's (2000) three-factor structure was the most rigorous, with factors for Thought Suppression, Unwanted Intrusive Thoughts, and Self-Distraction being noted. Thus, thought suppression and the experience of intrusive thoughts may be important as separate but related constructs.

As a result, recent studies are beginning to examine more closely the relationships among thought suppression, intrusive thoughts, and psychological symptoms. Research indicated that thought suppression (as measured by the WBSI total score) mediates the relationship between negative affectivity and unwanted intrusive thoughts (as measured by the Impact of Event Scale-Intrusions Subscale; Lynch, Schneider, Rosenthal, & Cheavens, 2007). Such results were maintained after eliminating the Unwanted Intrusive Thoughts subscale of Blumberg's (2000) WBSI factor analysis. Thus, Lynch and colleagues' (2007) findings also suggested that thought suppression and intrusive thoughts are separate constructs. Further, although these researchers examined collectively individuals of both sexes, they suggested that future research should examine sex differences in thought suppression and unwanted intrusive thoughts. Such an examination is important, as women scored significantly higher on the WBSI-total score (Wegner & Zanakos, 1994) and on Thought Suppression and Self-Distraction subscales (Luxton, Ingram, & Wenzlaff, 2006). Thus, these findings warrant further investigation.

Given the findings of these studies, the current study examined a mediational model in which intrusive thoughts serve as a mediator in the relationship between thought suppression and psychological symptoms. Relative

to previous studies, the current study also examined a wider range of psychological symptoms as outcome variables using a well-validated assessment tool, the Personality Assessment Inventory (Morey, 1994). So that sufficient variability could be achieved for each of the psychological symptoms that are examined here, a large, cross-sectional sample was recruited for participation. It was hypothesized that women would score higher than men on subscales of the WBSI, resulting in a need to examine findings for women and men separately. Further, it was anticipated that all subscales of the WBSI, particularly Unwanted Intrusive Thoughts, would correlate significantly with and predict the psychological symptoms examined in this study. Additionally, it was anticipated that the relationships between thought suppression and psychological symptoms would be mediated fully by intrusive thoughts.

Method

Participants

Initially, 499 undergraduate college students participated in this study. A subset of 283 individuals (233 female; 50 male) provided complete and valid information (see *Validity Considerations*); the data for these individuals are examined in the analyses for this study. In the demographics section of this study, participants were asked to select one category that identified their age grouping. The following were the frequencies of responses provided per category: 186 participants (65.7%) were 18- to 19-years old; 56 (19.8%) were 20- to 21-years old; 18 (6.4%) were 22- to 23-years old; 7 (2.5%) were 24- to 25-years old; 5 (1.8%) were 26- to 28-years old; 6 (2.1%) were 29- to 33-years old; 2 (0.7%) were 34- to 39-years old; 2 (0.7%) were 40-years or older; and 1 participant did not provide their age. Female participants varied in their racial self-identification (i.e., 70.4% were Caucasian, 5.2% were Black, 5.2% were Asian, 0.9% were Indian, 3.9% were Bi-Racial, and 14.6% endorse the 'Other' category). Male participants also varied in their self-identifications of race (i.e., 72.0% were Caucasian, 6.0% were Black, 6.0% were Asian, 4.0 % were Bi-Racial, and 12.0% endorsed the 'Other' category).

Measures

Demographic Information. Participants were asked to complete a series of brief questions requesting demographic information, such as their age, race, and ethnic origin, after which they completed the following measures.

Thought Suppression and Unwanted Intrusive Thoughts. The *White Bear Suppression Inventory* (WBSI; Wegner & Zanakos, 1994) is a 15-item measure of thought suppression. Participants answer questions such as "There are things I prefer not to think about" on a Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). Scores for the WBSI may range from 15 to 75, with higher scores indicating higher levels of thought suppression utilization. The

measure correlates positively with measures of Depression, Anxiety, and Obsessive-Compulsive features. In a previous study, Cronbach's alpha coefficients of internal consistency ranged from .87 to .97, and satisfactory test-retest reliability (.92 at 1 week and .69 at 3 months) was noted (Wegner & Zanakos, 1994).

In previous research on the WBSI, researchers examined the original WBSI one-factor structure as well as newly recommended two- (Rassin, 2003; Höping & de Jong-Meyer, 2003) and three- (Blumberg, 2000) factor structures for this measure. Blumberg's (2000) analyses appear to be the most rigorous thus far. This updated structure was used in a recent study (Wenzlaff & Luxton, 2003) and was utilized in the current study as well. According to Blumberg (2000), the three factors are Thought Suppression ($\alpha = .74$), Unwanted Intrusive Thoughts ($\alpha = .84$), and Self-Distraction ($\alpha = .75$). In the current study, Cronbach alpha coefficients were as follows: a Thought Suppression α of .70, an Intrusive Thoughts α of .89, a Self-Distraction α of .78, and an overall α of .92. In this study, the Thought Suppression and Intrusive Thoughts subscales were utilized in the mediational analyses that were conducted.

Psychological Symptoms. The *Personality Assessment Inventory* (PAI; Morey, 1991) is a 344-item measure that assesses the manifestation of symptoms related to clinical syndromes based on the current diagnostic classifications of mental disorders. Participants rate each statement (e.g., "I hardly have any energy") on a scale ranging from 1 ("False") to 4 ("Very True"). The measure yields several groupings of scale scores, including 11 main clinical syndrome scales with 28 clinical syndrome subscales, 5 treatment consideration scales, and 2 interpersonal scales. Additionally, the PAI provides four validity scales (i.e., Inconsistency [ICN], Infrequency [INF], Negative Impression [NIM], and Positive Impression [PIM]) that assess whether the results of this measure can be interpreted meaningfully.

The PAI main clinical syndrome scales were examined in this study and were as follows: Somatic Complaints (SOM), Anxiety (ANX), Anxiety-Related Disorders (ARD), Depression (DEP), Mania (MAN), Paranoia (PAR), Schizophrenia (SCZ), Drug Problems (DRG), Alcohol Problems (ALC), and one scale that assesses features of Borderline Personality Disorder (BOR). Also included in the analyses is the treatment consideration scale, Suicidal Ideation (SUI). The clinical syndrome scale assessing Antisocial Features is not included in the analyses.

In a previous study, the clinical syndrome main scales and subscales demonstrated adequate concurrent validity (Morey, 1991). The PAI also was designed to have strong construct (e.g., skilled diagnosticians were asked to sort scale items into various constructs) and discriminative (e.g., no overlapping items on the scales) validity (Morey, 1991). For extensive reviews of the continued assessment of PAI reliability and validity, see Morey (2004, 2006).

In a previous study, Cronbach's alpha coefficients of internal consistency for the main clinical syndrome scales reported for a college student population (in Morey, 1991) ranged from .66 to .89. In this previous study, adequate test-retest reliability also was established for all the main clinical syndrome scales, with correlations ranging from .66 to .90. Consistently, in the current study, Cronbach alpha coefficients ranged from .67 to .90 for the main clinical syndrome scales.

Procedure

The Institutional Review Board (IRB) at the university where this study was conducted approved the measures and procedures utilized before the commencement of this study. Data collection was conducted via a secure website where participants were provided with a brief written introduction to the study and were informed of their rights as participants. Participants who provided informed consent completed a series of web-based questionnaires that were followed by a debriefing statement. All participants, including those who did not complete the surveys fully, were provided with extra credit points to be used toward a Psychology course of their choosing as compensation for their participation.

Validity considerations

Multiple validity check criteria were used in this study to exclude any invalid or uninterpretable response patterns that may have occurred, particularly due to the web-based and unsupervised structure of the study. First, participants who stopped responding before reaching the end of the series of questions were removed (i.e., 40 were excluded). Next, six "validity check" items (e.g., "Select number three for this item, corresponding to Agree and Disagree equally") were generated and added at several points within each survey to address possible random endorsements, and participants who answered at least one of these incorrectly (i.e., 75 participants) were excluded from analyses. Additionally, the four validity subscales generated for the PAI (see *Measures*) were used as criteria for exclusion, with uninterpretable response patterns being selected out of the analyses (i.e., 101 excluded). Thus, a total of 216 initial participants were not included in analyses due to failure to pass at least one of the validity check criteria; however, the remaining information may be viewed as considerably valid and interpretable.

Results

Comparisons between those who completed the study and those who did not

Given that a portion of the original participants were removed from the analyses due to their failure to pass the outlined validity checks, χ^2 analyses were used to examine potential differences in demographic variables between the participants who were excluded and those who were included. Participants who

were included are more likely to be female, $\chi^2 (1) = 5.51, p < .05$. This finding was consistent with the fact that more female participants chose to participate in this study overall. No significant differences in race or age were found, $\chi^2 (6) = 12.29, NS$, and $\chi^2 (7) = 8.61, NS$, respectively. Further comparisons of differences in reports of psychological symptoms could not be conducted due to incomplete data provided by the excluded portion of the sample.

Descriptive statistics

Descriptive statistics indicated that all PAI main clinical syndrome scale means fell near or at the expected nonclinical level (i.e., approximately $T = 50$) for both sexes. Despite the fact that this was a college-based sample, a number of participants endorsed symptomatology within the clinically significant range (i.e., T score of 70 or above). See Table 1. For example, 8.5% and 7.1% of women endorsed clinically significant levels of Anxiety and Borderline Personality Disorder symptoms, respectively. Further, 6% and 4% of men endorsed clinically significant levels of symptoms associated with Mania and Depression, respectively.

Table 1. Means and standard deviations (SD) on the Main Clinical Syndrome Scales of the Personality Assessment Inventory by sex

PAI Scale	Males				Females			
	Mean	SD	Range	% T>70	Mean	SD	Range	% T>70
SOM	46.7	4.98	40-63	0.0	49.4	8.39	39-86	3.9
ANX	48.2	6.62	35-63	0.0	54.8	10.61	36-92	8.6
ARD	48.2	9.02	28-69	0.0	53.7	10.07	34-89	8.6
DEP	48.1	9.07	36-73	4.0	51.2	9.77	35-88	5.6
MAN	53.3	9.41	32-80	6.0	51.5	8.25	35-73	2.6
PAR	53.9	9.98	31-83	4.0	53.0	9.11	35-86	3.9
SCZ	49.1	8.67	36-73	4.0	47.6	8.07	32-74	0.9
DRG	49.0	9.04	42-76	8.0	48.8	8.00	42-82	3.0
ALC	49.4	9.63	41-86	6.0	49.9	9.12	41-88	4.7
BOR	51.8	7.94	38-69	0.0	54.6	9.28	36-83	7.3
SUI	48.0	7.12	43-72	4.0	49.4	8.42	43-89	4.3

Note. The PAI main clinical syndrome scales are the following: Somatic Complaints (SOM), Anxiety (ANX), Anxiety-Related Disorders (ARD), Depression (DEP), Mania (MAN), Paranoia (PAR), Schizophrenia (SCZ), Drug Problems (DRG), Alcohol Problems (ALC), Borderline (BOR) Personality Disorder, and Suicide (SUI)

Articles Section

Differences between women and men

To compare participants' WBSI subscale scores by sex, independent samples *t*-test analyses were used. Results revealed that female participants ($M = 8.61, SD = 3.36$) reported significantly higher levels of Self-Distraction as compared to male participants ($M = 7.50, SD = 2.87$), $t(277) = -2.18, p < .02$. There were no statistical differences in reports of Unwanted Intrusive Thoughts between men ($M = 25.14, SD = 7.12$) and women ($M = 25.21, SD = 7.78$) or in reports of Thought Suppression between men ($M = 13.73, SD = 3.35$) and women ($M = 13.98, SD = 3.29$), indicating that both female and male participants reported similar levels of these cognitive tendencies.

Relationships among thought suppression, intrusive thoughts, and psychological symptoms

Next, to examine the relationships among the variables examined in this study, two-tailed Pearson product-moment correlations were computed separately for women and men (i.e., so that the complete sample of women and men could be included) using the Thought Suppression (TS), Intrusive Thoughts (IT), and Self-Distraction (SD) subscales of the WBSI; the main clinical syndrome scales of the PAI; and the one treatment consideration scale, Suicidal Ideation (SUI), from the PAI. See Table 2.

Table 2. Correlations between White Bear Suppression Inventory Scores and Personality Assessment Inventory Clinical Syndrome Subscales by sex

PAI Scale	Males			Females		
	Intrusive Thoughts	Thought Suppression	Self-Distraction	Intrusive Thoughts	Thought Suppression	Self-Distraction
SOM	.33	.15	.15	.24***	.16	.18
ANX	.60***	.25	.39	.53***	.35***	.53***
ARD	.60***	.53***	.38	.56***	.35***	.47***
DEP	.46***	.07	.32	.47***	.30***	.45***
MAN	.14	.22	-.03	.19	.14	.11
PAR	.31	.17	.14	.39***	.30***	.33***
SCZ	.49***	.25	.36	.46***	.27***	.38***
DRG	.17	.18	.02	.08	.05	.08
ALC	-.01	.14	-.08	.17	.08	.15
BOR	.37	.15	.27	.51***	.38***	.43***
SUI	.31	.01	.15	.33***	.17	.23***

Note. Personality Assessment Inventory (PAI) scales include Somatic Complaints (SOM), Anxiety (ANX), Anxiety-Related Disorders (ARD), Depression (DEP), Mania (MAN), Paranoia (PAR), Schizophrenia (SCZ), Drug Problems (DRG), Alcohol Problems (ALC), Borderline (BOR) Personality Disorder, and Suicidal Ideation (SUI). White Bear Suppression Inventory (WBSI) scales include Thought Suppression (TS) and Unwanted Intrusive Thoughts (IT)
 *** $p < .002$

To account for Type-1 errors, a Bonferroni correction was applied (.05/22), resulting in the use of a p -value of 0.002 to indicate significant correlations. The current study was particularly interested in the correlations between the IT, TS, and PAI scales; however, the third subscale, Self-Distraction (SD) was included as it is the third component of Blumberg's (2000) factor structure. For women, both TS and IT were correlated significantly and positively with six of the eleven PAI scales, and IT was correlated significantly with an additional two PAI subscales. For men, the correlation patterns were less consistent. TS was correlated with one of the eleven scales (i.e., ARD), and IT was correlated significantly with four of the eleven scales on the PAI.

Predicting psychological symptoms

Next, hierarchical multiple regression analyses were used to assess the proposed mediational model (i.e., thought suppression would predict psychological symptoms by means of intrusive thoughts) based on recommendations by Baron and Kenny (1986). For women, all the regression analyses met basic criteria to be assessed for mediation (i.e., when examined independently, TS and IT predicted significantly all six outcome variables, and TS predicted significantly IT). These mediation analyses also were confirmed with significant Sobel tests of mediation. See Table 3. For example, the TS subscale predicted significantly both IT, $F(1, 224) = 133.53, p < .0005$, and the PAI Anxiety subscale (ANX), $F(1, 228) = 30.09, p < .0005$. The IT subscale also predicted ANX, $F(1, 226) = 86.88, p < .0005$. The aforementioned regression analyses met criteria to assess for a mediational relationship by entering TS and IT in the first and second blocks, respectively, of a final regression (Baron & Kenny, 1986). The model including both predictors was significant, $F(2, 223) = 44.61, p < .0005$, but the previously significant relationship between TS and ANX was no longer significant, $p < .38$. Results suggested that the experience of intrusive thoughts mediated fully the relationship between utilizing thought suppression and ANX. Such analyses were conducted on the other seven clinical scales and one treatment consideration scale (i.e., SUI) of the PAI. All regression analyses demonstrated that intrusive thoughts mediated fully the relationships between the use of thought suppression and psychological symptoms for women.

Similar procedures were conducted for men; however, only one of nine scales met criteria to be assessed for mediation (i.e., Anxiety Related Disorders; ARD). This mediation analysis also was confirmed by a significant Sobel test of mediation. See Table 4. The TS subscale predicted significantly both IT, $F(1, 48) = 30.21, p < .0005$, and the ARD subscale, $F(1, 48) = 19.04, p < .0005$. The IT subscale also predicted ARD, $F(1, 48) = 26.45, p < .0005$. The model including both independent variables (i.e., TS and IT) predicted significantly men's ARD scores, $F(2, 47) = 15.55, p < .0005$, but the previously significant relationship between TS and ARD was no longer significant, $p < .07$. The relationship between IT and ARD remained significant ($p < .004$). Results

Articles Section

Table 3. Hierarchical regressions for **females**: unwanted intrusive thoughts mediate the relationships between thought suppression and Clinical Syndrome Scale Scores on the PAI

	<i>B</i>	β	<i>t</i>	<i>R</i> ²	<i>F</i> (<i>df</i>)	<i>Sobel</i>
TS Predicting IT	1.45	.61	11.52***	.37***	132.67 (1, 223)	
(SOM) Block 1: TS	.41	.16	2.41*	.03*	8.12(1, 224)	2.86**
Block 2: TS	.03	.01	.13			
IT	.26	.24	2.96**	.06**	6.35(2, 223)	
(ANX) Block 1: TS	1.18	.36	5.86***	.13***	34.30(1, 224)	5.89***
Block 2: TS	.20	.06	.87			
IT	.67	.49	6.91***	.29***	44.61(2, 223)	
(ARD) Block 1: TS	1.08	.35	5.57***	.12***	31.06(1, 224)	6.52***
Block 2: TS	.04	.01	.17			
IT	.72	.55	7.86***	.31***	50.62(2, 223)	
(DEP) Block 1: TS	.90	.30	4.71***	.09***	22.22(1, 224)	5.41***
Block 2: TS	.06	.02	.26			
IT	.58	.46	6.17***	.22***	31.98(2, 223)	
(MAN) Block 1: TS	.36	.14	2.18*	.02*	4.77(1, 224)	1.88†
Block 2: TS	.12	.05	.56			
IT	.17	.16	1.92†	.04*	4.26(2, 223)	
(PAR) Block 1: TS	.83	.30	4.64***	.09***	21.52(1, 224)	4.16***
Block 2: TS	.24	.09	1.11			
IT	.41	.34	4.45***	.15***	21.54(2, 223)	
(SCZ) Block 1: TS	.69	.28	4.31***	.08***	18.57(1, 224)	5.48***
Block 2: TS	-.03	-.01	-.14			
IT	.49	.47	6.27***	.22***	30.52(2, 223)	
(BOR) Block 1: TS	1.09	.39	6.24***	.15***	38.98(1, 224)	5.57***
Block 2: TS	.30	.11	1.46			
IT	.55	.46	6.39***	.28***	43.33(2, 223)	
(SUI) Block 1: TS	.43	.17	2.52*	.03*	6.35(1, 224)	4.23***
Block 2: TS	-.14	-.06	-.70			
IT	.40	.36	4.54***	.11***	13.78(2, 223)	

Note. The first row provides information regarding the IV predicting the Mediator. The remaining rows provide information regarding the IV and the Mediator predicting the DV. Abbreviations include Somatic Complaints (SOM), Anxiety (ANX), Anxiety-Related Disorders (ARD), Depression (DEP), Mania (MAN), Paranoia (PAR), Schizophrenia (SCZ), Borderline (BOR) Personality Disorder, Suicidal Ideation (SUI), Thought Suppression (TS), and Intrusive Thoughts (IT). **p* < .05, ***p* < .01, ****p* < .001, †*p* < .10

suggested that the experience of intrusive thoughts mediated fully the relationship between utilizing thought suppression and ARD for men.

Table 4. hierarchical regressions for **males**: unwanted intrusive thoughts mediate the relationships between thought suppression and clinical syndrome scale scores on the PAI

	<i>B</i>	β	<i>t</i>	<i>R</i> ²	<i>F</i> (<i>df</i>)	<i>Sobel</i>
TS Predicting IT	1.32	.62	5.50***	.39***	30.21 (1, 48)	
(ARD) Block 1: TS	1.43	.53	4.36***	.28***	19.04(1, 48)	
Block 2: TS	.71	.27	1.03	.40***	15.55(2, 47)	2.67**
IT	.55	.43	2.99**			

Note. The first row provides information regarding the IV predicting the Mediator. The remaining rows provide information regarding the IV and the Mediator predicting the DV. Abbreviations include Anxiety-Related Disorders (ARD), Thought Suppression (TS), and Unwanted Intrusive Thoughts (IT). ** $p < .01$, *** $p < .001$

Discussion and conclusions

Overall, the findings of the current study suggested that further examination of the WBSI in conjunction with the experience of psychological symptoms is warranted. Hypotheses regarding sex differences on the WBSI subscales were supported partially. As expected, women reported significantly more self-distraction (SD). There were no sex differences, however, with regard to thought suppression (TS) or unwanted intrusive thoughts (IT). The current sex-related hypotheses were based on previous literature reporting sex differences on the WBSI total score (Wegner & Zanakos, 1994). The current study further confirmed sex differences for the SD subscale of the WBSI that were noted initially by Luxton and colleagues (2006) but failed to confirm the sex differences that were described previously for the IT and TS subscales of the WBSI. The inconsistent findings of the current study may be a result of the limited sample size for male participants relative to female participants. To our knowledge, there are few studies that examine sex differences with the new factor structure on the WBSI. The results for the IT and TS subscales suggested that additional research is warranted.

Correlational and regression analyses also confirmed partially the hypotheses regarding the relationships among thought suppression, intrusive thoughts, and psychological symptoms. For women, thought suppression (TS) and the experience of unwanted intrusive thoughts (IT) were correlated with most PAI clinical syndrome scales as well as with suicidal ideation (i.e., a treatment

consideration scale of the PAI). Such relationships only approached significance for mania-related symptoms. As expected, the relationship between thought suppression and psychological symptoms for women was mediated fully by the experience of intrusive thoughts, suggesting that the act of suppressing thoughts predicted the experience of psychological symptoms by way of intrusive thoughts. These findings supported previous research that demonstrated relationships between thought suppression and the psychological symptoms that were experienced as part of Depression, Anxiety, Borderline Personality Disorder, and suicidal ideation (e.g., Najmi et al., 2007; Purdon, 1999; Rosenthal et al., 2005). In addition, these results added to the literature by demonstrating that the use of thought suppression was predictive of the experience of symptoms associated with Schizophrenia and Paranoia. Even in this nonclinical sample of women, the use of thought suppression appeared to predict individuals' experience of unwanted intrusive thoughts. Intrusive thoughts also predicted strongly the experience of these distressing psychological symptoms.

For men, only one PAI clinical syndrome scale (i.e., Anxiety-Related Disorders) met preliminary criteria for mediation testing. In particular, the experience of intrusive thoughts mediated fully the relationship between utilizing thought suppression and ARD. This lack of findings for male participants was interesting in light of the relationships among thought suppression, intrusive thoughts, and several dimensions of psychological symptoms for female participants. The most apparent explanation for this finding was the small sample size for male participants (relative to female participants), which could decrease the power for the analyses described in this study. It also is possible that the percentages of participants scoring above the PAI clinical cut-off criteria were related to this low sample size. At least 1% of the female participants scored within the clinical range on all of the scales assessed; however, there were four of 12 scales for which none of the male participants had scores that exceeded the clinical cut-offs provided by the PAI.

A similarity between women and men, however, was the lack of significant correlations between thought suppression and endorsements of drug and alcohol abuse. This lack of significant relationships was somewhat surprising given that previous research described a link between thought suppression and a history of alcohol dependence (Klein, 2007). Klein (2007), however, examined participants who were considered to be abstinent alcoholics, and these individuals likely differed in their alcohol-related experiences relative to the current sample of college students used in this study. Further, given the considerable normalization of substance use in the college environment (Perkins, Haines, & Rice, 2005), this college student sample may not perceive their alcohol and substance use to be problematic.

Findings from the current study are of particular importance, as they suggested that the utility of the more traditional as well as the more contemporary psychological therapies, such as Acceptance and Commitment Therapy (ACT)

and Mindfulness-Based therapies (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Segal, Williams, & Teasdale, 2002), should continue to be examined, particularly for women. Further, the results of the current study suggested that research should examine the utility of such treatments for the reduction of symptoms related to severe and persistent psychological symptoms, such as those that are consistent with Schizophrenia and other disorders involving paranoia (e.g., Paranoid or Schizotypal Personality Disorders). Although such treatments could never replace the need for medication stabilization, cognitively based therapies may be useful as adjuncts to pharmacotherapies. For example, clients or patients may benefit from using such therapies to identify and begin to manage their intrusive thoughts in conjunction with their pharmacotherapy protocol. Such cognitively based therapies also may have some utility for reductions in symptom-related stress and improvements in outcomes for individuals who experience distressing symptoms.

Although the current study may help further our understanding of the relationships among thought suppression, intrusive thoughts, and psychological symptoms, it is important to consider its limitations, particularly those related to the restricted sample characteristics and self-report, cross-sectional methodology. First, the participants in this study were college students who, on average, were functioning well. Mean T-scores for the PAI subscales were within nonclinical limits, suggesting that, on average, these participants were not endorsing clinical levels of psychological symptoms. Despite such a limitation, strong relationships still were noted among the variables under investigation, and a fair percentage of participants' scores exceeded the PAI clinical cut-off score (i.e., $T > 70$). The sample also was restricted in the number of male participants. This restricted number of male participants was consistent with the demographics of the undergraduate students enrolled currently in Psychology courses at the university where the study was conducted. In an attempt to overcome some of these limitations, a large, cross-sectional design was utilized in this study; however, it is still likely that generalizability issues remain.

In addition, a large percentage of participants were dropped from analyses due to incomplete or invalid data. Anecdotally, the researchers received contact from several participants who were unable to complete the survey due to computer and/or internet problems mid-participation. These individuals had to restart the survey and likely accounted for a portion of the incomplete data. Other limitations may be due to the measures used in this study. For example, the PAI is self-report measure that is meant to guide clinicians within the context of a psychological assessment and should not serve as the sole basis for individual diagnosis. Finally, both the intrusive thoughts (IT) and thought suppression (TS) measures were derived from the same measure, the WBSI. Because they were derived from the same measure, a strong relationship may be the result of the items being developed together.

Future research should replicate the current study with a clinic-referred population, as some of the findings of the current study contradicted some of the previous literature (Klein, 2007). With discrepant findings between male and female participants, researchers should continue to examine separately the relationships among thought suppression, intrusive thoughts, and psychological symptoms for male and female participants. In addition, future studies should utilize samples with a larger number of male participants. Further, research should continue to examine the role that thought suppression, intrusive thoughts, and distraction play in serious and chronic disorders, such as Schizophrenia. To our knowledge, this study was the first to investigate such relationships, and the findings suggested that there is merit in examining these relationships further. Future studies, particularly those examining severe and persistent psychological disorders, also may choose to utilize structured clinical interviews (e.g., the Structured Clinical Interview for DSM-IV Axis I or II Disorders; SCID-I and SCID-II) in addition to self-report measures. Lastly, causal interpretations could not be made in the current study due to the cross-sectional design and the usage of regression analyses. As a result, future research should use longitudinal methodologies and/or Structural Equation Modeling techniques so that further insights can be gained.

Based on the findings of this study, however, refraining from the suppression of problematic thoughts and learning to accept the experience of subsequent intrusive thoughts may promote more beneficial outcomes for individuals experiencing psychological symptoms. Thus, learning to accept the occurrence of intrusive thoughts may lessen individuals' reliance on thought suppression. In turn, reductions in thought suppression may prevent further exacerbations of intrusive and unwanted thoughts and may be related to a reduction in distressing psychological symptoms.

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REFERENCES

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders (Fourth edition-Text revision)*. Washington, DC: Author.
- Abramowitz, J. S., Tolin, D. F., & Street, G. P. (2001). Paradoxical effects of thought suppression: A meta-analysis of controlled studies. *Clinical Psychology Review, 21*, 683-703.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.

- Beck, J. G., Gudmundsdottir, B., Palyo, S. A., Miller, L. M., & Grant, D. M. (2006). Rebound effects following deliberate thought suppression: Does PTSD make a difference? *Behavior Therapy, 37*, 170-180.
- Blumberg, S. J. (2000). The white bear suppression inventory: Revisiting its factor structure. *Personality and Individual Differences, 29*, 943-950.
- Borton, J. L. S., Markowitz, L. J., & Dieterich, J. (2005). Effects of suppressing negative self-referent thoughts on mood and self-esteem. *Journal of Social and Clinical Psychology, 24*, 172-190.
- Dalgleish, T., & Yiend, J. (2006). The effects of suppressing a negative autobiographical memory on concurrent intrusions and subsequent autobiographical recall in dysphoria. *Journal of Abnormal Psychology, 115*, 467-473.
- Garcia-Montes, J. M., Perez-Alvarez, M., & Fidalgo, A. (2003). Influence of the suppression of self-discrepant thoughts on the vividness of perceptions of auditory hallucinations. *Behavioural and Cognitive Psychotherapy, 31*, 33-44.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes, and outcomes. *Behaviour Research and Therapy, 44*, 1-25.
- Höping, W., & de Jong Meyer, R. (2003). Differentiating unwanted intrusive thoughts from thought suppression: What does the White Bear Suppression Inventory measure? *Personality and Individual Differences, 34*, 1049-1055.
- Klein, A. A. (2007). Suppression-induced hyperaccessibility of thoughts in abstinent alcoholics: A preliminary investigation. *Behaviour Research and Therapy, 45*, 169-177.
- Luxton, D. D., Ingram, R. E., & Wenzlaff, R. M. (2006). Uncertain self-esteem and future thinking in depression vulnerability. *Journal of Social and Clinical Psychology, 25*, 840-854.
- Lynch, T. R., Schneider, K. G., Rosenthal, M. Z., & Cheavens, J. S. (2007). A mediational model of trait affectivity, dispositional thought suppression, and intrusive thoughts following laboratory stressors. *Behaviour Research and Therapy, 45*, 749-761.
- Morey, L. C. (1991). *Personality Assessment Inventory - Professional manual*. Florida: Psychological Assessment Resources, Inc.
- Morey, L. C. (1996). *An interpretive guide to the Personality Assessment Inventory (PAI)*. Florida: Psychological Assessment Resources, Inc.
- Morey, L. C. (2004). The Personality Assessment Inventory. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment: Vol. 3. Instruments for adults*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Morey, L. C. (2006). The Personality Assessment Inventory and the measurement of normal and abnormal personality constructs. In S. Stack (Ed.), *Differentiating normal and abnormal personality* (pp. 451-472). New York, NY: Springer Publishing Company.
- Najmi, S., Wegner, D. M., & Nock, M. K. (2007). Thought suppression and self-injurious thoughts and behaviors. *Behaviour Research and Therapy, 45*, 1957-1965.
- Purdon, C. (1999). Thought suppression and psychopathology. *Behaviour Research and Therapy, 37*, 1029-1054.
- Purdon, C. (2004). Empirical investigations of thought suppression in OCD. *Journal of Behavior Therapy and Experimental Psychiatry, 35*, 121-136.

Articles Section

- Rassin, E. (2003). The White Bear Suppression Inventory (WBSI) focuses on failing suppression attempts. *European Journal of Personality, 17*, 285-298.
- Rassin, E., Muris, P., Jong, J., & de Bruin, G. (2005). Summoning white bears or letting them free: The influence of the content of control instructions on target thought frequency. *Journal of Psychopathology & Behavioral Assessment, 27*, 253-258.
- Rassin, E., & van der Heiden, S. (2006). Swearing voices: An experimental investigation of the suppression of hostile hallucinations. *Behavioural and Cognitive Psychotherapy, 35*, 355-360.
- Riskind, J. H., & Williams, N. L. (2005). A unique vulnerability common to all anxiety disorders: The looming maladaptive style. In L. B. Alloy & J. H. Riskind (Eds.), *Cognitive vulnerability to emotional disorders* (pp. 175-206). New York: Erlbaum.
- Rosenthal, M. Z., Cheavens, J. S., Lejuez, C. W., & Lynch, T. R. (2005). Thought suppression mediates the relationship between negative affect and borderline personality disorder symptoms. *Behaviour Research and Therapy, 43*, 1173-1185.
- Rude, S., & McCarthy, C. T. (2003). Emotional functioning in depressed and depression-vulnerable college students. *Cognition & Emotion, 17*, 799-806.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York, NY: Guilford Press.
- Van der Does, A. J. W. (2005). Thought suppression and cognitive vulnerability to depression. *British Journal of Clinical Psychology, 44*, 1-14.
- Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review, 101*, 34-52.
- Wegner, D. M., & Erber, R. (1992). The hyperaccessibility of suppressed thoughts. *Journal of Personality and Social Psychology, 63*, 903-912.
- Wegner, D. M., Schneider, D. J., Carter III, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53*, 5-13.
- Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality, 62*, 615-640.
- Wenzlaff, R. M., & Luxton, D. D. (2003). The role of thought suppression in depressive rumination. *Cognitive Therapy and Research, 27*(3), 293-308.
- Wenzlaff, R. M., & Wegner, D. M. (2000). Thought suppression. *Annual Review of Psychology, 51*, 59-91.

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