Maladaptive Beliefs and Suppression of Negative Autobiographical Memories

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This study sought to investigate whether an individual difference in beliefs regarding the importance of controlling intrusive thoughts influenced the effect of suppressing negative autobiographical memories. In Phase I of the study, 165 undergraduate students completed the control-subscale of the Interpretations of Intrusions Inventory (III-31). Students with scores in the top (strong beliefs) and bottom (weak beliefs) 30% of the III-31 were selected to participate in Phase II. In Phase II an equal number of students with these 'strong' and 'weak' beliefs (N = 60) were randomised to either a thought suppression or control condition. As expected, instructions to suppress resulted in a rebound effect; however, contrary to predictions, differences in beliefs regarding the importance of controlling intrusive thoughts did not influence thought suppression ability. The implications of the findings for understanding the influence of metacognition on thought suppression are discussed.

Following a traumatic event it is common for individuals to re-experience the event in the form of intrusive thoughts and memories (Shavel, 1992; Shavel, Schreiber, & Galai, 1993). For the majority of individuals these thoughts dissipate over time (Ehlers & Steil, 1995). Yet for a number of individuals these thoughts tend to persist (Davies & Clark, 1998), with persistent intrusions a hallmark feature of posttraumatic stress disorder (PTSD), one of the most common disorders to develop following traumatic events (American Psychiatric Association, 1994). For individuals with PTSD, thought suppression is a common technique used, aimed at controlling these thoughts and memories. However, the very act of trying to suppress thoughts has been shown to be counterproductive, as it leads to an increase in the very thought one is trying to avoid (Purdon, 1999; Rassin, Merckelbach, & Muris, 2000; Wenzlaff & Wegner, 2000).

Wegner's (1994) ironic process theory provides a comprehensive account of the effects of thought suppression (Wenzlaff & Wegner, 2000); however, it fails to adequately account for the development of intrusive symptoms in some trauma victims, but not in others. Instead, Purdon (1999) suggests that cognitive mechanisms underlying the thought suppression process may be important factor to consider in understanding PTSD aetiology. Furthermore, Ehlers and Steil (1995) propose that cognitive mechanisms, such as beliefs regarding intrusive thoughts that underlie the thought suppression process may in turn influence thought suppression ability. Therefore, future research in

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this area may benefit from a more thorough integration of Wegner's (1994) theory with cognitive models of PTSD such as that of Ehlers and Clark (2000).

Ehlers and Clark's (2000) cognitive model of PTSD emphasises the important role that cognitive processes, such as beliefs and appraisals, play in the aetiology and maintenance of PTSD. The model proposes that PTSD occurs when individuals process a traumatic event and/or its associated sequelae (e.g., intrusive thoughts) in such a way that produces a sense of current threat. According to the model, two processes lead to this threat — the memory of the event and/or the appraisal of the trauma and its sequelae. Thus it is argued that the traumatic memory fails to become completely incorporated as a past, autobiographical event, and remains easily retrieved in response to cues. Unhelpful appraisals of the trauma and sequelae, including symptoms, also maintain this sense of threat. For example, an individual might interpret intrusive memories as an indication he or she will never recover from the event. In response to this perceived threat individuals engage in cognitive and behavioural strategies, such as thought suppression, aimed at controlling the threat. As a result, the development of more realistic appraisals/beliefs is hindered, and pertinent to the present discussion, thought suppression strategies lead to increased intrusive symptoms.

Support for this model linking the negative appraisal of posttraumatic intrusive thoughts and thought suppression in PTSD has come from several studies. For example, Ehlers and Steil (1995) found that PTSD persistence was predicted by catastrophic negative appraisal of posttraumatic intrusive thoughts, which in turn emerged as a predictor of cognitive avoidance of these intrusions. Consistent with these findings, Ehlers, Mayou, and Bryant (1998) found that negative interpretation of intrusions was one of three predictors of PTSD symptoms at a 1-year follow-up.

At this time, however, the possible role of meta-beliefs concerning traumatic intrusions has not specifically investigated within the thought suppression paradigm. Dunmore, Clark and Ehlers (1999) suggest that the PTSD-prone individual may hold underlying dysfunctional beliefs in relation to the threat imposed by these posttraumatic intrusive thoughts and the importance of controlling these thoughts. For these individuals, the unpredictability and uncontrollability of these posttraumatic intrusive thoughts are a stressor in their daily lives, as they could resurface at any moment, thereby further heightening the individual's general level of anxiety (Purdon, 1999; Rachman, 1980). Therefore, in an attempt to minimise the threat imposed by these intrusive thoughts, the individual may endorse beliefs that mental control over these intrusive thoughts is important (Dunmore et al., 1999). Furthermore, Clark (1989) suggests that if an individual believes mental control over intrusive thoughts is important, he/she will feel a sense of urgency to control these intrusive thoughts and so expend greater cognitive effort in an attempt to control these intrusions. These beliefs may in turn motivate them to engage in behaviours, such as thought suppression, with the aim of gaining control over these intrusions (Dunmore et al., 1999).

To date two analogue thought suppression studies have indirectly examined the relationship between suppression and beliefs regarding the importance of controlling intrusive thoughts. Kelly and Kahn (1994) found that participants who experienced an increase in intrusive thoughts following a suppression instruction reported feeling greater feelings of distress and lack of control over their thoughts than control participants. In a follow-up study, Kelly and Nauta (1997) found that while an individual difference in reactance (a tendency to react to situations as if one's freedom is being

threatened) did not result in a postsuppression rebound in target-thought frequency, instructions to suppress did result in individuals high in reactance reporting feeling more out of control of their intrusive thoughts. It should be noted, however, that the scale used to measure reactance could be conceptualised as more a measure of personality or disposition, rather than one of metacognition regarding beliefs about the controllability of intrusive cognition. These analogue findings are consistent with research using OCD samples that has shown such individuals interpret inability to suppress as a form of mental failure, and these appraisals are associated with levels of distress caused by the intrusions (Purdon, Rowa, & Antony, 2005; Tolin, Abramowitz, Hamlin, Foa, & Synodi, 2002).

The purpose of the present study was to test in an analogue sample the proposition that metacognition regarding the importance of controlling intrusive cognition would be associated with increased intrusions in a thought suppression paradigm. Accordingly, undergraduate students were selected on the basis of their beliefs regarding intrusive cognition. Participants were instructed either to suppress or not suppress a memory of a negative event, and frequency of intrusions was measured. We expected that individuals who held strong beliefs regarding the importance of being able to control intrusive cognition would exert more effort in suppressing intrusive thoughts, especially when instructed to suppress. Similarly, we predicted that these individuals would demonstrate more intrusions than those with weaker beliefs, and that this effect would be most pronounced in the suppression condition.

Method

Phase 1

Participants

The sample comprised of 165 first year university students (male = 73, female = 92), ranging in age from 17 to 53 years with a mean age of 23.06 (*SD* = 7.69). Participants received course credit for their participation.

Measures

Negative autobiographical events and metacognition regarding intrusive memories. Participants were provided with a list of negative/traumatic events and asked to recall a similar personal event. This list was adapted from a study by Vrana and Lauterbach (1994), used in a student population. As not all students in the Vrana and Lauterbach study reported experiencing a Criterion A traumatic event, the items 'a traumatic relationship break-up' and 'a parents' divorce' were included as examples of negative type events. Participants either identified the event or indicated if the event was too personal to disclose by ticking a box, the latter option being a requirement of the University Ethics Committee. Participants then completed a modified form of the Interpretation of Intrusions Inventory (III-31; Obsessive Compulsive Cognitions Working Group [OCCWG], 2003) in reference to the identified negative event. Participants were provided with a definition of an intrusive thought or memory (Pope, 1978), and using the III-31, rated the following: when they last experienced a thought or memory of this kind, on a Likert-type scale ranging from 1 (*within the last year*) to 6 (*within the last 24 hours*); how frequently they had experienced the memory in the last 6 months, on a scale ranging from 1 (*less than once a month*) to 6 (*several times per day*); and the level of distress experienced when these intrusions occurred on a scale ranging from 1 (*none*) to 6

(*extreme*). Participants then completed the 9-item control subscale of the III-31 (c-III-31), a measure of beliefs regarding the importance of controlling intrusive thoughts. Responses were scored on a 10-point scale, from 0 (*I do not believe this idea at all*) to 10 (*I am completely convinced that this idea is true*) and summed. Example items included 'I must regain control of this thought' and 'Having this negative thought means that I am out of control'. Scores were summed and ranged from 0 to 90. The III-31 has shown to have excellent psychometric properties (OCCWG, 2003). Cronbach's alpha for the c-III-31 in the present study was .87.

Procedure

Following informed consent, participants completed the measures in a group setting and were informed that if they wished to volunteer for Phase II of the study, to seal their name and contact details in the envelope provided. Participants were told that due to time constraints only a random sample of volunteers would be selected.

Phase II

Participants

An equal number of volunteers (23 males, 37 females) with scores in the top ('strong' beliefs) and bottom ('weak' beliefs) 30th percentile of the c-III-31 were recruited from Phase I. The mean age of participants with 'strong' and 'weak' beliefs was comparable ($M = 22.20$, $SD = 5.50$; $M = 23.63$, $SD = 7.81$, respectively).

Procedure

Participants were randomly assigned to either a suppression or control condition and tested individually by the same researcher in a quiet, featureless room. Participants reported the time since the negative/traumatic event and rated their current level of distress regarding the event. The thought suppression experiment was then conducted. Participants were instructed to inform the researcher when an intrusion occurred by raising their finger. All participants were instructed to think of their negative event for one minute. Next, for a 5-minute period (the instruction period), participants randomised to the control condition were asked to 'close your eyes, let your mind wander'. Participants randomised to the suppression condition were asked to 'close your eyes, try not to think of the imagined event'. During the next 5-min period (the monitoring period), all participants were instructed to 'close your eyes, let your mind wander'. Intrusive thought frequency was again recorded. At the completion of the experiment, participants were asked to rate their level of suppression applied during the instruction period and their willingness to report intrusions of the event to the researcher.

Ratings

Participants indicated their present level of distress associated with the negative/traumatic event by marking a line on a 100-mm visual analogue scale (VAS). End points consisted of *not at all disturbing* and *extremely disturbing*. Ratings of the level of suppression were also obtained. A 100-mm VAS was again used, with end points consisting of not at all hard and extremely hard.

Results

A series of independent samples *t* tests revealed no difference between participants in Phase I who volunteered for Phase II and those who declined, in terms of when

the intrusive thought was last experienced, the frequency of the intrusive thought within the last 6 months and the amount of distress associated with the intrusive thought. Similarly, there was no difference in terms of these variables between those who volunteered and participated in Phase II and those who volunteered for Phase II but declined when contacted.

In terms of negative events, 23% reported the event being too personal to disclose, 21% reported a Criterion A event, 23% reported the death of a significant other, and the remainder reported other negative life events (e.g., relationship break-up). Table 1 details descriptive data regarding the recency, frequency, and distress associated with intrusive thoughts of these experiences. A series of independent samples *t* tests revealed no difference between participants who listed a negative-type or a traumatic-type event, in terms of when the intrusive thought was last experienced, the frequency of the intrusive thought within the last 6 months or the average amount of distress associated with the intrusive thought. Similarly, the 'strong' and 'weak' belief groups were comparable in terms of type of intrusive thought, as well as their ratings of frequency, distress, and time elapsed since their last intrusive experience.

As expected, scores on the c-III-31 for participants with weak beliefs (M = 8.50, *SD* = 5.85) were significantly lower than for participants with strong beliefs (M = 48.80, *SD* = 7.03), $t(58) = -24.14$, $p < .001$, $d = 6.23$. Mean scores for participants with strong beliefs in the present study were comparable to those scores on the c-III-31 obtained by the OCCWG (2003) using a sample of anxiety control patients (M = 48.8, *SD* = 25.6), which included individuals with PTSD. Participants with 'strong' beliefs reported greater distress associated with their negative event than 'weak' belief participants, (M = 3.97, *SD* = 1.19 versus M = 2.97,

TABLE 1

Types of Negative/Traumatic Events and Related Intrusive Thought Frequency and Level of Distress for Participants in Phase II

		Ratings for intrusive thought		
		Last experience[a]	Frequency[b]	Level of distress[c]
Type of experience	*N* (%)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Death of significant other	14 (23%)	4.00 (1.69)	2.47 (1.25)	3.40 (1.06)
Too personal	13 (21%)	3.42 (1.78)	3.17 (1.40)	3.50 (1.38)
Relationship break-up	12 (20%)	4.82 (1.78)	3.00 (1.61)	3.09 (1.22)
Other negative	9 (15%)	2.50 (2.14)	2.25 (1.75)	3.38 (1.77)
Accident	4 (7%)	4.50 (1.73)	2.50 (1.30)	3.25 (0.50)
Life threatening illness	4 (7%)	4.25 (1.71)	3.75 (1.71)	4.50 (1.30)
Unwanted sexual act	3 (5%)	3.33 (2.52)	3.33 (2.31)	4.00 (0.00)
Criminal act	1 (2%)	6.00 (0.00)	2.00 (0.00)	3.00 (0.00)

Note: [a] Ratings made on a 6-point scale (1 = *within the last year,* 6 = *within the last 24 hours)*
[b] Ratings were made on a 6-point scale (1 = *less than once a month,* 6 = *several times per day*)
[c] Ratings were made on a 6-point scale (1 = *none,* 6 = *extreme*)

TABLE 2
Mean Level of Suppression During Instruction Period by Group

Group	Instruction	*M* (*SD*)
Weak beliefs	Suppression	7.73 (1.44)
	Control	3.40 (1.55)
Strong beliefs	Suppression	8.67 (1.50)
	Control	5.27 (1.28)

SD = 1.16), $t(58) = 3.30$, $p = .002$, $d = 0.85$; however, controlling for distress in subsequent analyses did not alter any pattern of results.

To assess suppression effort, a 2 (group: strong beliefs, weak beliefs) × 2 (instruction: 'suppress, let mind wander') mixed design ANOVA was conducted. As expected, there was a main effect of group, $F(1, 56) = 14.10$, $p < .001$, $\eta^2 = .20$, with individuals with strong beliefs about thought control endorsing higher levels of thought suppression than those with weak beliefs. Similarly, there was a main effect of instruction; thus individuals in the suppression condition reported higher levels of suppression than the control condition, $F(1, 56) = 107.53$, $p < .001$, $\eta^2 = .66$. Unexpectedly, there was no group × instruction interaction, $F(1, 56) = 1.57$, $p = .216$, $\eta^2 = .03$, indicating the level of suppression across the experimental instruction did not vary as a function of group.

A 2 (group: strong beliefs, weak beliefs) × 2 (instruction: 'suppress, let mind wander') × 2 (time: instruction period, monitoring period) mixed design ANOVA was performed on target-thought frequency. As suggested in Table 3, the results of the ANOVA revealed no main effect for level of belief, $F(1, 56) = 0.04$, $p = .884$, $\eta^2 < .001$. That is, contrary to prediction, there was no significant difference in target-thought frequency between participants with weak and strong beliefs regarding the importance of controlling intrusive thoughts. Similarly the level of belief × time interaction was only a nonsignificant trend, $F(1, 56) = 2.85$, $p = .097$, $\eta^2 = .05$.

The result of the ANOVA revealed there was no main effect for instruction type, $F(1, 56) = 0.30$, $p = .584$, $\eta^2 = .01$, however there was a main effect of time, $F(1, 56) = 9.11$, $p = .004$, $\eta^2 = .14$, and the thought suppression rebound effect was demonstrated by the significant interaction between instruction type and time, $F(1, 56) = 9.73$, $p = .003$, $\eta^2 = .15$. Tests of simple effects demonstrated that control participants did not experience a rebound effect, whereas suppression participants did, reporting more intrusions in the monitoring period relative to the instruction period, $t(29) = -4.33$, $p < .001$, $d = 0.64$.

Discussion

The aim of the present study was to test the proposition that individuals who held strong beliefs regarding the importance of being able to control intrusive cognition would experience more intrusions of negative autobiographical events than those with weaker beliefs during a thought suppression experiment. Contrary to predictions, participants with such beliefs generally demonstrated comparable levels of intrusions relative to participants who did not endorse such beliefs as strongly, and there was not a differential effect as a function of the instruction to suppress thoughts. Although this study is the first to test this proposition experimentally, the

TABLE 3

Mean Number of Target-Thoughts for the Instruction and Monitoring Periods, by Instruction Type and Level of Belief

	Level of belief		
	Weak beliefs	Strong beliefs	Total
Group	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Control condition			
Instruction period	5.75 (3.13)	5.53 (3.25)	5.60 (3.22)
Monitoring period	5.13 (3.29)	6.06 (3.28)	5.63 (3.13)
Total	10.88 (6.08)	11.60 (5.74)	11.23 (5.82)
Suppression condition			
Instruction period	5.33 (2.61)	4.73 (3.08)	5.03 (2.82)
Monitoring period	6.80 (3.53)	7.27 (3.14)	7.03 (3.40)
Total	12.13 (5.63)	12.00 (5.99)	12.06 (5.71)

findings were not consistent with previous analogue research that would suggest a relationship (e.g., Kelly & Kahn, 1994; Kelly & Nauta, 1997). Again, although nonexperimental, previous research using clinical samples (e.g., Dunmore et al., 1999) has demonstrated that negative interpretations of symptoms (including intrusions) is associated with the development and persistence of PTSD. There are several explanations for the nonsignificant finding in the present study. Individuals with weak control belief who were instructed to suppress did so at a level comparable to the strong control belief group. Thus both groups were suppressing equally hard, which on the one hand explains the observed rebound effect of intrusions, but at the same time might have limited the degree to which differences might have been observed between the two groups. It is possible that within a nonclinical sample, those who were categorised as having strong beliefs regarding the importance of control over cognition did not endorse these beliefs to a clinically significant degree that would have an impact on thought suppression. The fact that participants in this group had the same mean score as published psychometric data for a clinical sample with anxiety disorders suggests that this might not account for the null findings. Another possibility is that a different type of belief has more influence on thought suppression. For example, catastrophic interpretations of PTSD symptoms (including intrusions) has been shown to predict the persistence of PTSD (Dunmore et al., 1999; Ehlers & Steil, 1995). Research into various types of metacognition would elucidate the potential influence of such beliefs. Alternatively, it may be that metacognition itself is not associated with the rebound effect, but is related more to maintaining attempts of mental control over such thoughts (cf. Wenzlaff & Wegner, 2000).

It should be noted that in terms of the recency and stressfulness of the autobiographical event there was a reasonable range among participants. Although the events were generally rated as negative, these scores tended to fall in the mid-range, thus it is possible that the self-selected events participants chose in the experiment did not evoke in participants a strong need for control. While the autobiographical nature of the events on the one hand offered clinical validity to the design, it may have at the same time introduced the confound for practice effects (i.e., previous suppression attempts) in those predicted to have greater difficulty in suppression.

The influence of practice, motivation to suppress, and differences between persistence of suppression in the laboratory versus the real world have all been argued to be key variables in regard to mixed findings of autobiographical thought suppression studies (see Kelly & Kahn, 1994; Monteith, Sherman, & Devine, 1998; Trinder & Salkovskis, 1994; Wenzlaff & Wegner, 2000). Future research would benefit from the use of novel, very negative stimuli in this regard. Finally, 23% of participants did not disclose their event and it could be questioned whether these participants truly chose a negative event to suppress in the experiment. However, spontaneous disclosures during debriefing from participants in previous studies we have conducted indicates that some of these participants have chosen extremely distressing events, often child sexual abuse or adult sexual assault, which they were initially hesitant in reporting. Although anecdotal, it is reasonable to expect that a reasonable proportion of this subsample had memories of sensitive and personal experiences they did not want to report.

Despite the primary hypothesis being unsupported, the study has a number of strengths. First, it sought to extend previous correlational research regarding the role of metacognition concerning mental control to experimental design. Second, it demonstrated that suppressing distressing material can lead to a rebound effect, which is consistent with the findings of the meta-analysis by Abramowitz, Tolin and Street (2001) and thought suppression studies demonstrating that this effect generalises to autobiographical target-thoughts (Roemer & Borkovec, 1994; Salkovskis & Campbell, 1994; Trindler & Salkovskis, 1994). Thus, these current findings demonstrate the temporary nature of control that thought suppression offers. Third, the high prevalence of traumatic-type events reported in this undergraduate sample was comparable to the incidence of traumatic events in a student population documented by Vrana and Lauterbach (1994). This finding justifies the use of student samples for analogue trauma research, indicating that such participants frequently have backgrounds of traumatic exposure not unlike the individuals who develop posttraumatic stress disorders following adverse life events.

In summary, this study was successful in replicating the findings of previous thought suppression studies, demonstrating the temporary control that thought suppression affords the individual. Although several studies have shown rebound effects in thought suppression experiments with posttraumatic stress populations (e.g., Harvey & Bryant, 1998; Shipherd & Beck, 1999), studies have yet to explore the underlying mechanisms for thought suppression ability in these populations within experimental designs. Future experimental research into the potential relationship between metacognition and thought suppression would benefit from investigating this relationship in the context of novel negative stimuli, examining these relationships experimentally in clinical samples, and including other variables that have been hypothesised to undermine thought suppression processes. The accumulating evidence that intrusive autobiographical memories are common in other clinical disorders such as depression, and are also predictive of later symptomatology (Brewin, Reynolds, & Tata, 1999; Kuyken & Brewin, 1994) underscores the benefits of better understanding the relationships between metacognition, thought suppression and intrusions.

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