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Thought suppression and self-injurious thoughts and behaviors

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Abstract

This study proposes and tests a theoretical model suggesting that the propensity to suppress unwanted thoughts is associated with an increased presence and frequency of self-injurious thoughts and behaviors (SITB). In the model, propensity to suppress unwanted thoughts is hypothesized to be a cognitive mediator of the relationship between emotional reactivity and SITB, and is expected to be related to the extent to which SITB is initiated to escape from aversive emotions. Results of this cross-sectional study of adolescents ($N = 87$) revealed that the self-reported propensity to suppress unwanted thoughts is associated with the presence and frequency of non-suicidal self-injury (NSSI), suicidal ideation, and suicide attempts. Furthermore, thought suppression partially mediates the relationship between emotional reactivity and the frequency of NSSI and suicidal ideation. Finally, adolescents with a higher tendency to suppress unwanted thoughts report engaging in NSSI in order to reduce aversive emotions rather than for social communication. Results are discussed within the framework of the negative reinforcement function of SITB.

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Keywords: Self-injury; Suicide; Thought suppression; Emotion regulation; Self-harm

Introduction

People who are highly emotionally reactive experience a high magnitude of aversive thoughts and emotions. To cope with these, they may use any of a host of mental control strategies in the attempt to alleviate the distress associated with these thoughts and emotions. One such strategy may be the suppression of aversive thoughts. Thought suppression is often a counterproductive strategy unless it is carried out by focusing on a single distracter. For individuals who engage in self-injurious thoughts and behaviors (SITB), it may be the case that high emotional reactivity leads to a heightened experience of aversive thoughts and emotions, which can trigger suppression attempts, which in turn exacerbate the unwanted thoughts and emotions. Ultimately, in order to reduce emotional arousal, the individual may use SITB as a focused distracter.

Self-injury as a self-distraction response to cope with aversive emotions

Prior theoretical and empirical work suggests that one of the primary purposes of engaging in multiple forms of SITB, including non-suicidal self-injury (NSSI), suicidal ideation, and suicide attempts, is to

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terminate aversive cognitive and/or emotional experiences. For instance, Baumeister (1990) has proposed that when one's sense of self is markedly inferior to held standards, it triggers the desire to escape from self-awareness and its concomitant aversive emotions. "Suicide thus emerges as an escalation of the person's wish to escape from meaningful awareness of current life problems and their implications about the self" (p. 91). Consistent with this perspective, escape from intolerable experiences has been reported by those who have survived a suicide attempt as one of the leading reasons for such behavior (Boergers, Spirito, & Donaldson, 1998; Hawton, Cole, O'Grady, & Osborn, 1982). Moreover, Nock and Prinstein (2004, 2005) found that escape from aversive thoughts or feelings also is the primary reason given for engaging in NSSI.

These results suggest that engaging in SITB is a consciously initiated strategy to stop overwhelming, negative emotions. Prior work has shown that heightened emotional reactivity is indeed related to the frequency of SITB (Nock, Wedig, Holmberg, & Hooley, 2006) but the mechanisms underlying this association are not known. To the extent that aversive thoughts maintain aversive emotions, techniques aimed at reducing the frequency of these thoughts can be expected to mitigate the emotions. Thus, one possibility is that thought suppression mediates the relationship between emotional reactivity and SITB.

Thought suppression, emotion regulation and psychopathology

Thought suppression—the deliberate attempt to not think of something—is a strategy of cognitive control, consciously initiated, often in the service of emotion regulation when thoughts create unpleasant emotions (Wegner, 1989). What is most relevant to disorders of unwanted thoughts is that this strategy is not sustainable by most people in the face of competing cognitive demands. Furthermore, when the strategy fails, unwanted thoughts do not only return to their initial baseline, but to a much higher frequency (see reviews by Abramowitz, Tolin, & Street, 2001; Rassin, 2005; Wegner, 1989; Wenzlaff & Wegner, 2000). Wegner and Gold's (1995) *defensive suppression hypothesis* states that thought suppression is more likely to occur for emotional thoughts, both spontaneously in daily life and in the confines of an experiment. Moreover, when thoughts create unpleasant emotions, people are likely to engage in chronic thought suppression (Wegner, Erber, & Zanakos, 1993). To more directly assess the role of suppression in emotional regulation, Wegner and Zanakos (1994) reanalyzed the data from Wegner and Gold's (1995) study and found that individuals who endorsed a greater tendency to suppress unwanted thoughts reacted more strongly to an emotional thought. More specifically, those with a greater tendency to suppress unwanted thoughts continued to respond to their unwanted thought with elevated skin conductance levels, whereas those less prone to thought suppression appeared to regulate their emotions and thus experienced a decrease in skin conductance level.

Indeed, many forms of psychopathology are characterized by the intrusive accessibility of unwanted thoughts (Clark, 2005). This may reflect, to some extent, a failure of attempted suppression or the use of maladaptive forms of distraction from these intrusive thoughts. The counterproductive effects of thought suppression have been observed in experimental studies of obsessive intrusions (see reviews by Rassin, 2005; Wenzlaff & Wegner, 2000), posttraumatic stress disorder (Shipherd & Beck, 1999), acute stress disorder (Harvey & Bryant, 1998) and depression (Wenzlaff & Bates, 1998).

Thought suppression using self-distraction

People often engage in a spontaneous self-distraction strategy when they are confronted with overwhelming negative emotion (Wegner, 1989; Wenzlaff, 2005). In other words, thought suppression is attempted by means of thinking of distracters. According to the *ironic process theory of mental control* (Wegner, 1994), successful suppression can be achieved by increasing the accessibility of distracter thoughts. Usually when people try to suppress thoughts, they tend to undertake an *unfocused distraction* strategy—the iterative use of many different distracters rather than just one focus—and experience a rebound of the suppressed thought (Wegner, Schneider, Knutson, & McMahon, 1991). However, this rebound effect is attenuated when using a *focused distracter* (Harvey & Payne, 2002; Salkovskis & Campbell, 1994; Wegner, Schneider, Carter, & White, Experiment 2, 1987). This successful focused distraction from the unwanted thought is often an adaptive strategy for reducing distress associated with aversive thoughts (e.g., Johnstone & Page, 2004) and for reducing the frequency of these thoughts (Salkovskis & Campbell, 1994). However, it may, in some cases, be

maladaptive when the distracter itself is harmful, such as when SITB becomes the focused distracter from thoughts that create aversive emotions.

Proposed model

We propose (see Fig. 1) that individuals who are highly emotionally reactive experience a high magnitude of aversive thoughts and emotions, and that some of these individuals respond to the emotions using coping strategies aimed at achieving reduction in emotional arousal. One such strategy may be attempts to consciously suppress aversive thoughts. Successful, albeit temporary, suppression of aversive thoughts and avoidance of concomitant aversive emotions is achieved using SITB as the focused distracter. Thus, we hypothesize the following sequence in our theoretical model: High emotional reactivity leads to a heightened experience of aversive thoughts and emotions, which triggers suppression attempts, which in turn exacerbate the unwanted thoughts and emotions. Ultimately, in order to reduce emotional arousal the individual distracts him/herself using SITB.

The goal of the current study was to conduct an initial, cross-sectional test of this theoretical model. By elucidating the cognitive mechanisms that maintain SITB, we aim to develop a more nuanced understanding of this dangerous and pervasive behavioral problem. If supported, this model would point toward maladaptive mental control strategies such as thought suppression as potential targets of change in treatment of SITB.

We predicted that the propensity to suppress unwanted thoughts would be associated with the presence and frequency of a range of SITB (i.e., NSSI, suicidal ideation, suicide attempts). Following from the hypothesized model, we predicted that the propensity to suppress unwanted thoughts would mediate the relationship between emotional reactivity and the frequency of SITB. Finally, consistent with the negative reinforcement function of thought suppression and self-injury in the model, we predicted that those adolescents who report a higher propensity to suppress unwanted thoughts would report engaging in NSSI for negative reinforcement (e.g., “to stop the bad feelings”) but not for positive reinforcement (e.g., “to communicate with others”).

Method

Participants

A total of 94 (73 female) adolescents and young adults (age in years: $M = 17.14$, $SD = 1.88$, range 12–19) were recruited from the community and local psychiatric clinics for participation in this study. We chose to focus on this age range given the high rates of self-injury reported during adolescence (14–39%; Ross & Heath,

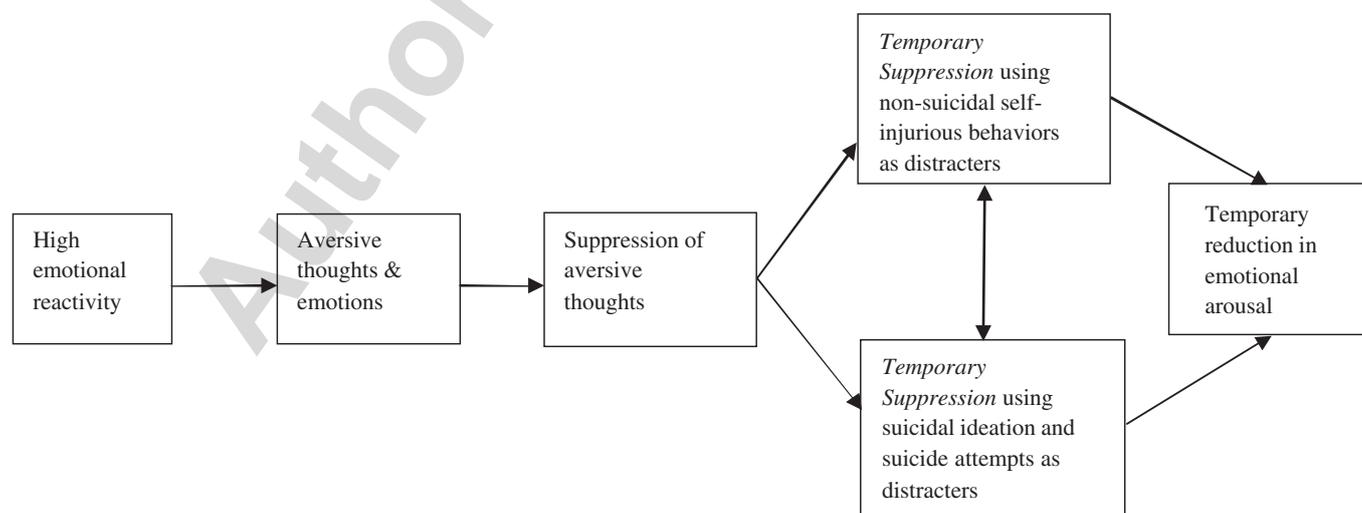


Fig. 1. Hypothesized model for negative reinforcement function of thought suppression and self-injury.

2002) as compared to adulthood (4%; Briere & Gil, 1998). Inclusion criteria were age 12–19 years and provision of written informed consent to participate in the research, with parental consent required for those less than 18 years-old. More girls than boys responded to our advertisement, which sought individuals with a recent history of self-injurious behavior. Control participants were recruited to match the self-injury group in age, sex, and ethnicity. Seven participants were excluded from the current analyses due to incomplete data for two key self-report measures used in this study (*WBSI* and *ERS*). Thus, the final sample was composed of 87 participants (68 female; age in years: $M = 17.0$, $SD = 1.9$, range 12–19). Ethnicity was self-identified as European American (72.4%), Biracial (11.5%), Hispanic (6.9%), Asian American (4.6%), African American (3.4%), and Other ethnicity (1.1%).

Measures

White Bear Suppression Inventory [WBSI]

The *WBSI* (Wegner & Zanakos, 1994) is a 15-item measure of the individual's propensity to try to suppress unwanted thoughts. It is not a measure of failure or success of thought suppression, that is, it is a motivational construct, not one of performance or ability. Each item is rated on an A to E scale (A = "Strongly disagree" and E = "Strongly agree"). The scale has high internal consistency, reliability over different samples, and test-retest reliability.

Self-Injurious Thoughts and Behaviors Interview [SITBI]

Participants were administered the *SITBI* (Nock, Holmberg, Photos, & Michel, 2006), a clinician-administered interview that assesses the presence, frequency, severity, age-of-onset, and other characteristics of a broad range of SITB including NSSI, suicidal ideation, suicide plans, suicide gestures, and suicide attempts. In the current study, items were used that inquired about the presence and lifetime frequency of engaging in three different self-injurious constructs: NSSI ("Have you ever done something to hurt yourself without intending to die?"), suicidal ideation ("Have you ever had thoughts of killing yourself?"), suicide attempt ("Have you ever made an actual attempt to kill yourself in which you had at least some intent to die?"). Prior work (Nock, Holmberg et al., 2006) revealed that the *SITBI* has strong inter-rater reliability (average $\kappa = 0.99$, $r = 1.0$) and test-retest reliability over a 6-month period (average $\kappa = 0.70$, $ICC = 0.44$). Construct validity was demonstrated via strong correspondence between the *SITBI* and other measures of suicidal ideation (average $\kappa = 0.54$), suicide attempt ($\kappa = 0.65$), and NSSI (average $\kappa = 0.87$) from the Schedule for Affective Disorders and Schizophrenia for School Aged Children—Present and Lifetime Version (K-SADS-PL; Kaufman, Birmaher, Brent, Rao, & Ryan, 1997), the Beck Scale for Suicide Ideation (BSS; Beck, Steer, & Ranieri, 1988), and the Functional Assessment of Self-Mutilation (FASM; Lloyd, Kelley, & Hope, 1997).

Additionally, in the current study, *SITBI* items were used that inquired about the reasons for engaging in NSSI. A functional assessment of self-injurious behaviors was conducted such that individuals reported, on a 0–4 scale, the extent to which they engaged in NSSI for automatic negative reinforcement (e.g., "to get rid of bad feelings") and for social positive reinforcement (e.g., "to communicate with others"). Notably, the construct validity of the functional assessment items from the *SITBI* has been supported via strong correlations with subscales representing related constructs from the more extensive FASM measure, such as the automatic negative ($r = 0.72$) and social positive reinforcement ($r = 0.73$) functions of NSSI ($p < 0.001$) (Nock, Holmberg et al., 2006). *SITBI* interviews were conducted by MKN as well as two clinical psychology graduate students and two post-baccalaureate research assistants. Prior to data collection, all interviewers participated in several training sessions on the administration of the *SITBI* led by MKN. Training included review of the *SITBI* items and practice administering the interview.

Emotional Reactivity Scale [ERS]

The *ERS* is a 21-item self-report measure designed to assess the individual's experience of emotional reactivity. The *ERS* assesses three primary components of emotion sensitivity (8 items; e.g., "I tend to get emotional very easily"), emotion intensity (10 items; e.g., "When I experience emotions, I feel them very strongly/intensely"), and emotion persistence (3 items; e.g., "When I am angry/upset, it takes me much longer

than most people to calm down”) that sum to one overall score. Each item is rated on a 0–4 scale (0 = “Not at all like me” and 4 = “Completely like me”), with total possible scores ranging from 0 to 84. Prior work (Nock, Wedig et al., 2006) has supported the internal consistency (Cronbach’s $\alpha = 0.94$) and construct validity of the ERS: the ERS was positively correlated with measures of similar constructs from the Behavioral Inhibition/Behavioral Activation Scales (BIS/BAS, Carver & White, 1994) and the Early Adolescence Temperament Questionnaire (EATQ-Revised—Long Form; Ellis & Rothbart, 2001) such as behavioral inhibition ($r = 0.37$), fear ($r = 0.37$), frustration ($r = 0.53$), negatively correlated with measures such as attentional control ($r = -0.45$), and unrelated to other constructs such as behavioral activation/drive ($r = -0.09$).

Results

Data transformation

Since the frequency distributions of NSSI, suicidal ideation, and suicide attempts were positively skewed, natural logarithmic transformations were performed. Values transformed as $\ln(1+x)$ were used for all relevant analyses as recommended by Tabachnick & Fidell (2001).

Thought suppression and self-injury

We tested the relation between the propensity to suppress unwanted thoughts and SITB in two ways, first using *t*-tests to examine whether those who engage in SITB have higher WBSI scores, as well as using regression analyses to examine whether those with higher WBSI scores engage in more frequent SITB. As shown in Table 1, results revealed that the WBSI was related to both the presence and frequency of NSSI, suicidal ideation, and suicide attempts.

Thought suppression as mediator of relation between emotional reactivity and self-injury

A key assumption of our hypothesized model is that thought suppression is likely to be used more often as a cognitive strategy when thoughts are related to aversive emotions. In other words, if there are no aversive thoughts or feelings, there is little motivation to suppress. Therefore, we expect that the tendency to suppress thoughts may be one mechanism through which heightened emotional reactivity is related to SITB. We tested the mediational role of the propensity to suppress unwanted thoughts in the relation between emotional reactivity and the frequency of SITB using a series of regression analyses as specified by Baron and Kenny (1986). If all criteria for potential mediation were met, we assessed the presence of mediation by the Sobel test (Sobel, 1982). In order to improve reliability of measurement and to decrease the probability of a Type I error, individual lifetime frequency values for NSSI, suicidal ideation, and suicide attempts were converted into standard scores and combined into a single measure of the frequency of SITB.

To test the hypothesis that the propensity to suppress unwanted thoughts statistically mediates the relationship between emotional reactivity and the frequency of SITB, first, WBSI scores were regressed on

Table 1

The relationship between the propensity to suppress thoughts (WBSI) and the presence and frequency of non-suicidal self-injurious behaviors, suicidal ideation, and suicide attempts

	Presence		t_{85}	Cohen’s <i>d</i>	Frequency
	No <i>M</i> (SD)	Yes <i>M</i> (SD)			
Non-suicidal self-injury	39.90 (13.53)	55.35 (12.98)	−5.20***	1.13	$\beta = 0.51$
Suicidal ideation	37.89 (12.61)	55.48 (12.72)	−5.99***	1.30	$\beta = 0.59$
Suicide attempts	47.20 (15.29)	57.87 (11.25)	−3.06***	0.66	$\beta = 0.32$

*** $p < 0.001$

ERS scores ($\beta = 0.61$, $t_{85} = 7.18$, $d = 1.54$, $p < 0.001$). Second, frequency of SITB was regressed on ERS scores ($\beta = 0.34$, $t_{85} = 3.29$, $d = 0.71$, $p < 0.001$). When the frequency of SITB was regressed on both ERS and WBSI scores, WBSI scores still significantly predicted the frequency of SITB ($\beta = 0.28$, $t_{84} = 2.25$, $d = 0.49$, $p < 0.03$). Finally, the effect of ERS on the frequency of SITB was reduced significantly from $\beta = 0.34$ ($t_{85} = 3.29$, $d = 0.71$, $p < .001$) to $\beta = 0.16$ ($t_{84} = 1.27$, $d = 0.28$, $p > 0.2$) when the frequency of NSSI was regressed on both ERS and WBSI scores, *Sobel*, $p < 0.03$ (Sobel, 1982). Therefore, results suggest that the propensity to suppress unwanted thoughts mediates the relation between emotional reactivity and the frequency of SITB (Fig. 2).

To further clarify these results, follow-up analyses were conducted for the three individual components of SITB. Results revealed that the propensity to suppress unwanted thoughts mediates the relation between emotional reactivity and suicidal ideation (*Sobel*, $p < 0.001$), and partially mediates the relation between emotional reactivity and the frequency of NSSI (*Sobel*, $p < 0.01$). However, when the frequency of suicide attempts was regressed on both ERS and WBSI scores, WBSI scores no longer significantly predicted the frequency of suicide attempts ($\beta = 0.21$, $t_{84} = 1.64$, $d = 0.36$, $p = 0.10$), thus violating the third condition required for a test of mediation.

Negative reinforcement function of thought suppression and self-injury

One assumption in hypothesizing a role of thought suppression in maintaining NSSI is that individuals who engage in NSSI do so in order to avoid negative thoughts and emotions (see Fig. 1). In other words, we do not expect that thought suppression plays a role in all NSSI, but rather that the propensity to suppress unwanted thoughts would be related to the extent to which NSSI was performed to escape from unwanted thoughts or feelings, and not necessarily to the extent to which NSSI was performed for other reasons, such as to communicate with others. To test this hypothesis, we separated participants into high and low thought suppression groups using a median-split of WBSI scores and tested differences between these groups on the extent to which they reported engaging in NSSI “to get rid of bad feelings” versus “to communicate with others” on the SITBI. Results revealed that individuals who reported a greater tendency to suppress unwanted thoughts endorsed “to get rid of bad feelings” as their reason for engaging in NSSI to a significantly greater extent ($M = 3.27$) than did individuals who reported a lower tendency to suppress unwanted thoughts ($M = 2.60$), $t_{55} = -2.39$, $d = 0.64$, $p = 0.02$. Moreover, the high thought suppression group ($M = 0.84$) did not differ significantly from the low thought suppression group ($M = 1.10$) on the extent to which they engaged in NSSI to communicate with others, $t_{55} = 0.75$, $d = 0.10$, $p = 0.46$. These results are consistent with the hypothesis that the tendency to get rid of unwanted thoughts in general is also manifested in the need to get rid of the specific negative thoughts and emotions that trigger NSSI.

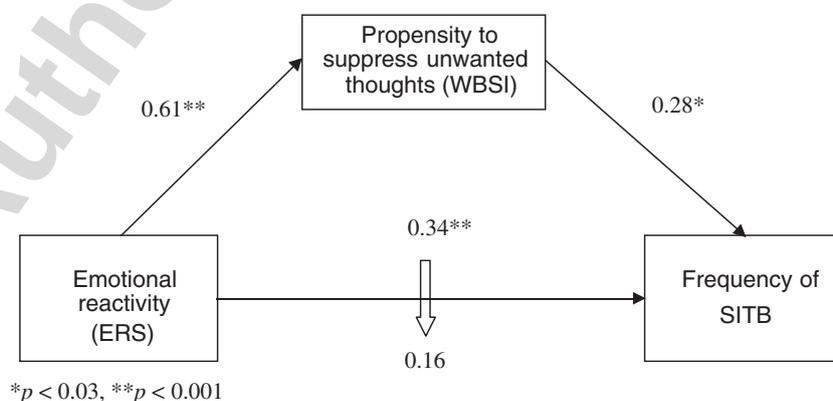


Fig. 2. The propensity to suppress unwanted thoughts mediates the relationship between emotional reactivity and SITB. * $p < .03$, ** $p < .001$

Discussion

Taken together, results of the study support the hypothesized model of the role of thought suppression in the experience of SITB (see Fig. 1). The self-reported propensity to suppress unwanted thoughts was associated with the presence and frequency of NSSI, suicidal ideation, and suicide attempts. Furthermore, thought suppression mediated the relationship between emotional reactivity and the frequency of SITB, in particular NSSI and suicidal ideation. Results did not support the hypothesized mediational role of the propensity to suppress thoughts in the relationship between emotional reactivity and frequency of suicide attempts. This finding is consistent with prior work showing that different forms of SITB (e.g., suicide ideation, suicide gestures, suicide attempts) are indeed distinct behaviors and are associated with other constructs in different ways (see for example Nock & Kazdin, 2002; Nock & Kessler, 2006). However, an alternative explanation for the statistically non-significant associations for suicide attempts in this study is the low frequency of suicide attempts in our sample. The mean lifetime frequency of suicide attempts was 1.17, as compared to a much higher lifetime frequency of NSSI ($M = 89.72$) and of suicidal ideation ($M = 82.00$).

Finally, adolescents with a higher tendency to suppress unwanted thoughts reported engaging in NSSI in order to reduce aversive emotions (“to stop the bad feelings”) and not for social gain (“to communicate with others”). This is consistent with our hypothesis regarding the negative reinforcement function of thought suppression and SITB. Thus, we did not expect that the propensity to suppress unwanted thoughts would be associated with all types of motivation for SITB. Rather, we expected that the propensity to suppress unwanted thoughts would be related specifically to the extent to which SITB was performed to escape from unwanted thoughts or feelings, and not to the extent to which SITB was performed for other reasons, such as to communicate with others. Results of the present study were consistent with this prediction.

It is important to stress that our model is not intended to be comprehensive for all SITB but rather may be limited to SITB that is maintained by negative reinforcement. Thus, the model does not purport a role of thought suppression in the maintenance SITB that is performed in order to communicate with others or to generate feelings when feeling numb, two other reasons individuals have given for engaging in SITB (e.g., Brown, Comtois, & Linehan, 2002; Nock & Prinstein, 2004). Furthermore, our model is not intended to be comprehensive for all metacognitive strategies aimed at reducing emotional arousal. Instead, we focus on the role of thought suppression, which, we recognize, is one strategy in the repertoire of approaches aimed at experiential avoidance (e.g., Campbell-Sills, Barlow, Brown, & Hofmann, 2005; Hayes, Strosahl, & Wilson, 1999; White, Brown, Somers, & Barlow, 2006). We have chosen to focus on thought suppression on account of the sizeable empirical evidence suggesting a pervasive use of this strategy in a range of disorders of emotion regulation.

One possibility that remains to be investigated further is the extent to which individuals who engage in SITB try to suppress thoughts of NSSI and suicide. The measure of propensity to suppress thoughts used in this study (WBSI) assesses the response to nonspecific unwanted thoughts. Based on the emotion regulation model of SITB, we hypothesized that SITB is used as a means of distraction from other unwanted thoughts. However, it is possible that thoughts related to NSSI and suicide, while a distraction from other aversive thoughts, are themselves aversive. It may be that those prone to suppression try to suppress these thoughts as well, experience the futility of the endeavor and the consequent return of these thoughts, and ultimately engage in self-injurious behaviors (NSSI or suicide attempt) in order to attain reduction in emotional arousal. This possibility, while not ruled out by our hypothesized model, has not been evaluated directly here.

A key limitation of our study is the reliance on self-report methods. Thus, all of the constructs in our study are subject to problems inherent in retrospective reporting. Nevertheless, given that this is the first study to test a theoretical model for the relationship between emotional reactivity, thought suppression, and SITB, we hope that it will motivate future studies for testing the model more directly. One possibility is the use of psychophysiological measures of emotional reactivity and implicit measures of accessibility of suppressed and distracter thoughts. Another limitation of our paradigm is the use of a cross-sectional design to test a model that asserts a specific temporal sequence of events, namely, (i) emotional arousal, followed by (ii) the need to escape the emotions, followed by (iii) thought suppression using SITB as a focused distracter, and finally, (iv) temporary reduction in emotional arousal. In our study we have successfully shown statistical mediation, but any interpretation of a temporal sequence and a causal chain in the model is speculative until tested longitudinally.

Nevertheless, the present study adds to the growing literature on the mechanisms that maintain SITB, thus facilitating a more comprehensive understanding of the disorder. Furthermore, the study extends previous research on the role of misguided mental control in the maintenance of psychopathology. In due course, we hope that maladaptive metacognitive strategies such as thought suppression might become targets of change in clinical treatment of emotional disorders.

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