

Suppressing thoughts of evaluation while being evaluated

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Abstract

Thought suppression can cause ironic increases in the occurrence of intrusive thoughts. Intrusive thoughts of evaluation could be especially disruptive while undergoing evaluation. Such a context, however, could help suppression efforts as the context provides an external source for which to attribute suppression failures. When suppressing thoughts of evaluation in a non-evaluative context (a context-content mismatch), typical ironic effects of thought suppression occurred. There was no increased accessibility of evaluation, however, when suppressing evaluation in an evaluative context (a context-content match), which allowed for attributing intrusive thoughts to the context, rather than the self, making suppression easier. Suppressing thoughts of evaluation may be beneficial in an evaluative context, suggesting that the consequences of willful suppression are moderated by context.

Being evaluated by others is a ubiquitous occurrence in everyday life. Concern with the evaluation of one's performance is a key component in performance anxiety, anxiety experienced prior to or during performance in a number of domains, including public speaking, sexual performance, sports, the performance arts, and test taking (Baumeister, 1984; Beilock & Carr, 2001; Hardy, Mullen, & Jones, 1996; Kenny, 2005). One potential way of coping with this concern about evaluation is to simply suppress thoughts of evaluation. Trying to suppress thoughts of evaluation, however, might lead to *more* thoughts of evaluation and preoccupation with performance. Indeed, thought suppression, the willful attempt to control one's thoughts, has been shown to have *ironic effects*, namely a paradoxical increase in the occurrence of the target thought (Wegner, Schneider, Carter, & White, 1987).

The seminal study on thought suppression instructed participants to not think about a white bear (Wegner et al., 1987). Participants suppressing thoughts about white bears indeed thought less about white bears, relative to participants who were explicitly asked to think about white bears. Yet, in a free-thought exercise following suppression, participants who had previously suppressed thoughts about white bears paradoxically thought *more* about white bears than even participants who had been explicitly instructed to think about

them. This increase of target thoughts (i.e., thoughts about white bears) following suppression attempts is termed post-suppressional rebound (Wegner et al., 1987). Of particular importance for the current work is that *during* suppression attempts, thoughts about white bears were still present (even if less than during explicit instruction to think about white bears).

Thinking about evaluation, while undergoing evaluation, leads to a preoccupation with evaluation, which typically harms performance (Baumeister, 1984; Beilock & Carr, 2001; Hardy et al., 1996; Kenny, 2005). The current research tests whether attempting to suppress thoughts of evaluation, while undergoing evaluation, will backfire by increasing thoughts of evaluation, and ultimately harm performance. Extensive research has demonstrated ironic and negative effects of thought suppression in numerous domains, including negative self-referent thoughts, disordered eating, trauma, illness, addiction, and secrecy (e.g., Hoyt, Nemeroff, & Huebner, 2006; Lepore & Helgeson, 1998; Najmi, Wegner, & Nock, 2007; Purdon, 1999; Slepian, Masicampo, Toosi, & Ambady, 2012). Specifically, when individuals willfully attempt to suppress distressing thoughts to cope, these attempts can backfire by increasing the distressing thoughts that they are trying to suppress (Wegner, 1994). A meta-analysis on thought suppression has demonstrated

that, post-suppression, suppressed thoughts often rebound; yet, suppression attempts are sometimes successful *during* suppression (Abramowitz, Tolin, & Street, 2001). One reason that suppression sometimes fails during suppression attempts may be that the success of suppression depends on the context. We propose that the ironic effects of thought suppression, during suppression attempts, might diminish when the context allows one to make external attributions for suppression failures.

This prediction is derived from the motivated inference account of post-suppressional rebound (cf. Liberman & Förster, 2000; Wegner, 1994). After the constraint to suppress thoughts is lifted, the suppressed thought becomes more accessible than if the thought was not initially suppressed (i.e., post-suppressional rebound; Wegner et al., 1987). The motivational theory for post-suppressional rebound suggested by Liberman and Förster (2000; drawing from self-perception theory; Bem, 1972) is that the unexpected difficulty of thought suppression might make people infer that they actually are motivated to think about the suppressed construct, ironically enhancing motivation to think about the construct, and ultimately its accessibility. Previous work has indeed demonstrated that motivation to think of the suppressed construct is inferred from suppression failures or difficulty. When unexpected intrusive target thoughts occur (such as when suppression of the target thought is expected to be easy and it is not), people infer that these failures to suppress target thoughts indicate that they are motivated to think about such thoughts (Förster & Liberman, 2001). When people believe that suppressing thoughts is a difficult activity (and thus expect intrusive thoughts), however, an external attribution becomes available as now participants attribute those intrusive thoughts to the difficulty of suppression rather than an internal motivation. Attributing intrusive thoughts to the difficulty of suppression then reduces motivation to think of, and consequently the accessibility of the construct (Förster & Liberman, 2001).

We extend previous work in several ways. First, across all studies, suppression attempts in the domain of thinking about being evaluated are examined—a consequential domain for performance anxiety. Second, intrusive thoughts of evaluation *during* suppression attempts, rather than afterward, are examined. Third, we examine whether the congruity between suppression context and suppression content moderates the success of suppression attempts during suppression. We suggest that when a situation seems evaluative, this will provide an external source for which to attribute initial suppression failures (thoughts about evaluation). The congruity between suppression context and suppression content should minimize inferred motivation to think of evaluation, making suppression attempts easier and, consequently, more successful.

Study 1: Suppression Failures during Suppression

Although post-suppressional rebound is important in many circumstances (e.g., suppression of stereotypes; Macrae, Bodenhausen, Milne, & Jetten, 1994), it is less relevant in the applied setting of suppressing thoughts of evaluation. In an evaluative context (e.g., taking a test), intrusive thoughts of evaluation during evaluation will be most relevant to ongoing performance. The current work is focused on concurrent suppression, as post-suppression effects cannot affect prior performance during evaluation, whereas concurrent suppression failures can. We suggest that the motivated inference account proposed to explain post-suppressional rebound is also relevant for accessibility of target thoughts *during* suppression: Difficulty experienced during suppression might be inferred as motivation to think of the to-be suppressed construct. Thus, we extend the motivated inference framework used to explain post-suppressional rebound to account for hyperaccessibility during suppression in the current work (cf. Förster & Liberman, 2001; Wegner & Erber, 1992).

To test our predictions, we first examined whether suppression of evaluation in a nonevaluative context would result in intrusive thoughts of evaluation, relative to a control condition where no restriction on thoughts was made. We predicted that an incongruity between suppression context and suppression content would exacerbate suppression failures, as the context would not allow for external attributions for suppression failures.

Rather than comparing suppression to expression (Wegner et al., 1987), we compared to it a control *mention* condition (as expression would surely lead to more target thoughts). The instructions used in this alternative control condition have been used in many studies demonstrating ironic effects (Lavy & van den Hout, 1990; Rassin, Merkelbach, & Muris, 1997). This comparison is the more appropriate test for the current hypothesis, as it has already been demonstrated that focusing on evaluation is not beneficial for performance (e.g., Baumeister, 1984; Beilock & Carr, 2001), but it is unclear whether suppression of evaluation is also harmful by eliciting intrusive thoughts of evaluation. Therefore, suppression was compared to a control free-thought (but evaluation mention) condition to better test whether individuals can suppress thoughts of evaluation.

Method

Pretesting

To ensure that the suppression context was relatively nonevaluative, 20 undergraduates were asked, “How evaluative does a ‘pilot study’ seem?” and “How evaluative does a computer task, in which you need to respond quickly and accurately, seem?” from 1 (*not at all*) to 7 (*entirely*).

Participants rated a pilot study as less evaluative ($M = 3.95$, $SD = 0.89$) than the computer task ($M = 4.70$, $SD = 1.52$), $t(19) = 2.07$, $p = .05$, $d = 0.95$. A mere pilot study seemed relatively nonevaluative, whereas a description of a typical psychology experiment (a computer task requiring speed and accuracy) seemed relatively evaluative. Therefore, to minimize the evaluative nature of the task, the current study was described as a pilot study.

Procedure

Thirty-two undergraduates (69% female) took part in one of two between-subject conditions based on random assignment. In one condition, *thought suppression*, participants were instructed to think about anything they would like to, but that for the next 5 minutes they were to avoid all thoughts of evaluation. Specifically, they were told to “avoid all thoughts of evaluation, whatever evaluation means to you.” They were told that every time a thought of evaluation came to mind, they should mark a tally on a provided piece of paper. The other half of the participants, in the second control *mention* condition (i.e., evaluation was mentioned), were told to “spend the next five minutes thinking about whatever you would like, but if a thought of evaluation comes to mind, whatever evaluation means to you, you should mark a tally for each time this happens.” For both conditions, to try to make the task relatively nonevaluative, participants were explicitly informed that the experiment was merely a pilot study.

Results and discussion

Participants who suppressed thoughts of evaluation, as indicated by marked tallies, reported thinking of evaluation more during the 5 minute period ($M = 9.47$, $SD = 7.98$) than did participants in the mention condition ($M = 4.82$, $SD = 2.51$), $t(30) = 2.28$, $p = .03$, $d = 0.83$. These results suggest that when the suppression context (nonevaluation) does not match the suppression content (evaluation), more intrusive thoughts of the construct occur during suppression.

Study 2: Attributions for Suppression Failures

The first study suggested that thought suppression of evaluation leads to intrusive thoughts of evaluation during suppression—when in a nonevaluative context. It was next examined whether providing an external source for which to attribute intrusive thoughts would diminish inferred motivation to think of evaluation, therefore actually reducing motivation to think of evaluation, and consequently reducing the accessibility of evaluation. In the following studies, we examine this causal chain (see Spencer, Zanna, & Fong, 2005). A pilot study examined whether people attribute intrusive thoughts about evaluation differently to an external

source versus an internal source in different contexts (evaluative vs. nonevaluative). Study 2 tested if people would exhibit less intrusive thoughts when external attributions versus internal attributions for suppression failure were suggested. Study 3 tested whether the congruity between suppression context and suppression content would facilitate successful suppression efforts.

Pilot study

When in a relatively evaluative setting, it was hypothesized that participants would be more likely to attribute thoughts of evaluation as merely due to the evaluative nature of the situation. Attributing thoughts of evaluation to an external source would render attributions to an internal source (i.e., the participant’s motivation to think of evaluation) less necessary.

In a pilot study (conducted online; Buhrmester, Kwang, & Gosling, 2011), 24 participants were randomly assigned to imagine that they were either in a psychology experiment or in a park. Participants were asked: (a) “How much do you think you might think about evaluation?” from 1 (*not at all*) to 5 (*a lot*), and (b) they were asked to imagine that if they did indeed have thoughts of evaluation to what extent they would occur as a result of the situation, “I would be thinking of evaluation as a result of the situation,” and to what extent these thoughts would be self-initiated, “I would be thinking of evaluation as a result of wanting to think about evaluation.” They indicated their agreement with these two attributions from 1 (*strongly disagree*) to 7 (*strongly agree*). As predicted, participants who imagined themselves in a psychology experiment expected that they would think of evaluation more ($M = 4.50$, $SD = 0.52$) than those who imagined themselves at a park ($M = 1.92$, $SD = 0.90$), $t(22) = 8.60$, $p < .001$, $d = 3.67$. Additionally, a 2 (context: experiment, park) \times 2 (attribution: internal, external) mixed-model analysis of variance (ANOVA) with attributions as the within-subjects variable revealed the predicted interaction: Participants who imagined themselves in a psychology experiment expected to make more external than internal attributions for thoughts of evaluation ($M_{\text{difference}} = 2.83$, $SD = 1.70$) than did those who imagined themselves in a park ($M_{\text{difference}} = 1.17$, $SD = 2.17$), $F(1, 22) = 4.40$, $p = .048$, $d = 0.89$. Thus, when imagining themselves in a relatively evaluative context, participants indeed report that they are more likely to attribute thoughts of evaluation to the external situation than to the self.

Consequently, we next tested whether manipulating attributions for intrusive thoughts would have an influence on thought suppression failures. Providing an external source for which to attribute intrusive thoughts should reduce perceived self-motivation to think of evaluation, thereby reducing actual motivation to think of evaluation and ultimately intrusive thoughts of evaluation.

Method

Thirty undergraduates (67% female) suppressed thoughts of evaluation for 5 minutes, marking a tally for each intrusive thought of evaluation. In both between-subjects conditions, participants were instructed to think about anything they would like to, but that for the next 5 minutes they were to avoid all thoughts of evaluation. Participants were told that difficulty suppressing evaluation is a consequence of either (a) motivation to think about evaluation (internal attribution condition), or (b) the evaluative situation (external attribution condition), based on random assignment. These instructions were adopted from previous manipulations of thought suppression attributions (Förster & Liberman, 2001), and replicate conditions from the pilot study, wherein participants here were either induced to have an internal or external attribution for intrusive thoughts of evaluation. We predicted that when internal attributions were suggested for intrusive thoughts of evaluation, motivation to think of evaluation would be inferred from initial suppression failures, leading to more thoughts of evaluation. In contrast, when external attributions were suggested for intrusive thoughts of evaluation, motivation to think of evaluation would be less likely to be inferred, leading to less thoughts of evaluation.

Results and discussion

As indicated by marked tallies, participants who were told that thought suppression failures indicated motivation to think of evaluation had more intrusive thoughts of evaluation ($M = 9.00$, $SD = 5.72$) than those who were told that failures were a result of the evaluative situation ($M = 5.06$, $SD = 3.62$), $t(28) = 2.28$, $p = .03$, $d = 0.86$. In other words, providing an external (vs. internal) attribution for suppression failures reduced reported intrusive thoughts during suppression.

Study 3: Suppression of Evaluation during Evaluation

Across Studies 1 and 2, a relatively nonevaluative context led to more internal than external attributions for intrusive thoughts of evaluation, which corresponded to more suppression failures. A mismatch between suppression context and suppression content yields no external source for which to attribute suppression failures, enhancing internal motivation to think of the construct, hurting suppression efforts. In Study 3, we manipulated whether suppression context and content matched, and tested if a match would enhance suppression efforts. Suppression of evaluation in an evaluative context might be successful as such a setting evokes more external than internal attributions for suppression failures, and more external than internal attributions leads to more successful suppression.

Similar to Study 1, participants suppressed thoughts of evaluation, but additional between-subjects conditions were added for comparison. The four conditions were suppression of evaluation, concentration on evaluation, and suppression versus concentration of a control construct: communication. Communication was chosen as a control target thought because it is relevant to interpersonal behavior, like evaluation, yet does not imply evaluation (i.e., in an evaluative context, this is incongruous suppression content, a suppression context-content mismatch). These control conditions allowed us to examine, within the same design, whether suppressing, relative to concentrating on, a construct (communication) that does not match the suppression context (evaluation) would lead to established hyperaccessibility effects, and if suppressing a construct (evaluation) that does match the suppression context (evaluation), which allows for external attributions, would instead diminish accessibility.

Additionally, a cognitive load was added. Previous work demonstrates that a cognitive load makes thought suppression more difficult (e.g., Wegner & Erber, 1992). Increasing the difficulty of suppression (and thus resulting intrusive thoughts) should provide a conservative test for our hypothesis that attempting to suppress thoughts of evaluation in an evaluative context would lead to a *decrease* in intrusive thoughts of evaluation.

Finally, an implicit measure of intrusive thoughts, hyperaccessibility as measured by interference in a Stroop task, was used. This measure has been utilized successfully in previous thought suppression studies as a sensitive measure of intrusive thoughts (e.g., Wegner & Erber, 1992; Wegner, Erber, & Zanakos, 1993). Naming only the color of a word, while ignoring the meaning of it, requires effortful selective attention (MacLeod, 1991). For this reason, if suppression attempts increase accessibility of target thoughts, this greater accessibility will cause interference that makes it harder to ignore a target word, and therefore more difficult to name only the color of it during the Stroop task, ultimately increasing reaction time (RT; see McKenna & Sharma, 1995). Thus, if suppression attempts increase accessibility of target thoughts, they should increase RT in response to relevant target words, relative to control words.

Before discussing our predictions in the context of the Stroop task, we briefly discuss the differences between this method and the method used in Study 1, both of which have been used in prior work. In Study 1, participants simply marked a tally for each thought of evaluation, and suppression was compared to a control condition, in which they were allowed to think freely, but mention was made of evaluation. The Stroop task was used here as it constitutes a less disruptive and more sensitive measure of online thought accessibility, and concentration was adopted for the comparison condition as is standard for the Stroop measure of accessibility: Hyperaccessibility during suppression, relative

to concentration, is the measure of suppression failure (see Wegner & Erber, 1992; Wegner et al., 1993). Additionally, in thought-listing tasks, concentration on a construct leads to more *reported* thoughts about that construct than suppression of that construct (though participants still do report thinking about the construct a significant amount during suppression attempts). Yet, when using an accessibility measure such as a Stroop task, a different pattern of results emerges. Target thoughts that are concurrently being suppressed are actually more accessible during suppression than when concentrating on those thoughts (e.g., Wegner & Erber, 1992). Because this sensitive measure demonstrates an ironic *increase* of accessibility during suppression, relative to concentration, we utilized this methodology for the current study, which thus again provides a conservative test of our hypothesis of *less* accessibility during suppression of evaluation in an evaluative context.

Our hypothesis—that an evaluative context (provided by the Stroop task itself, rated as evaluative in pretesting; Study 1) might actually reduce accessibility of evaluation concurrent with suppression attempts—leads to the following predictions. When suppressing (vs. concentrating on) thoughts of the control construct (communication) in an evaluative context (i.e., there is a mismatch between suppression context, evaluation; and suppression content, communication), established interference effects should be evident. Specifically, participants should be especially slow to name the color of the word *communication* during suppression of communication, relative to concentration on communication, due to interference caused by the paradoxically accessible thoughts of communication. Yet, due to the evaluative nature of the task (i.e., accuracy and speed are emphasized), we expected a different pattern to emerge for suppressing vs. concentrating on evaluation. When suppressing thoughts of (vs. concentrating on) evaluation (i.e., there is a match between suppression context, evaluation; and suppression content, evaluation), we instead expected reduced accessibility of evaluation (due to external attributions from the matching context improving suppression efforts), and thus did not expect a slowing down to name the color of the word *evaluation*.

In sum, for suppression of communication there is *no* external source for which to attribute resulting thoughts of communication, as the context was made to be evaluative rather than communicative (i.e., participants performed a task rated as evaluative, but alone in a cubicle). In contrast, when the suppression context matches suppression content, external attributions for suppression failures will be available. Suppression (vs. concentration) of evaluation should therefore lead to relatively less concurrent accessibility of evaluation, whereas classic accessibility effects should be found for *communication* wherein the suppression context does not match the suppression content.

Method

Two hundred and twelve undergraduates (56% female) spent 5 minutes either suppressing or concentrating on either evaluation or communication (i.e., four between-subjects conditions). Subsequently, all participants were required to memorize a nine-digit number (i.e., the cognitive load). They were shown the number for 30 seconds before it was removed. Participants were told to keep the number in memory while continuing to suppress or concentrate on thoughts of evaluation or communication, during which participants performed a Stroop task that included the words *evaluation*, *communication*, and unrelated filler words. This procedure—along with the provided instructions—matches the cognitive load condition used in Wegner and Erber's (1992) Experiment 2. In the Stroop task, the words *evaluation* and *communication* each appeared nine times with 36 filler words, for a total of 54 trials. Additionally, 12 practice trials preceded the 54 experimental trials to familiarize participants with the task. Words appeared in red, green, or blue, with each filler word appearing once in each color, and with *communication* and *evaluation* each appearing three times in each color. Following the Stroop task, participants were asked to report the nine-digit number (the manipulation check for cognitive load). Finally, participants filled out a thought control manipulation check that asked to what extent they tried to follow thought control instructions (suppression or concentration) from 1 (*not at all*) to 7 (*very much*) and were subsequently debriefed and dismissed.

Results and discussion

Four participants failed to follow the experimental procedure properly (they did not follow thought control instructions) and were thus excluded from the analysis. Additionally, 13 participants misreported multiple digits of the nine-digit number at the end of the study, indicating they did not devote enough resources for this task, and thus these participants were excluded (as is typically done; e.g., Wegner, Broome, & Blumberg, 1997). Our thought control manipulation check revealed that the remaining participants did indeed follow thought control (suppression or concentration) instructions. A one-sample test against the midpoint of the scale (4) revealed that participants reported that they suppressed/concentrated on the construct ($M = 5.79$, $SD = 1.43$), $t(193) = 16.84$, $p < .0001$, $d = 2.42$, and a one-way ANOVA revealed no between-condition differences, $F(3, 190) = 1.90$, $p = .13$.¹ Also important, during debriefing, participants demonstrated that they understood the thought control instructions. Additionally, when asked what the study was about, 94% of participants made mention of a test of ability

¹One participant's manipulation check data were lost due to computer error.

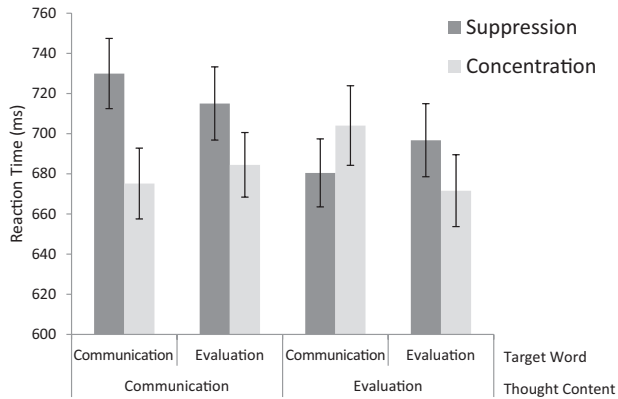


Figure 1 Reaction times in the Stroop measure of hyperaccessibility in Study 3.

or performance. In sum, participants did indeed find the experimental session evaluative and explicitly mentioned that they thought they were being evaluated in some way. No participants correctly guessed the experimental hypothesis.

Incorrect responses and responses exceeding personal average RTs by three standard deviations on the Stroop task were excluded (5% of trials; see Robinson, 2007). After these exclusions, a 2 (thought control: suppression, concentration) \times 2 (thought content: evaluation, communication) \times 2 (target word: evaluation, communication) mixed-model ANOVA, with target word as the within-subjects variable and RT as the dependent measure, revealed no effects of thought control, $F(1, 191) = 1.59, p = .21$, thought content, $F(1, 191) = 0.57, p = .45$, or target word, $F(1, 191) = 1.37, p = .24$, nor did it reveal two-way interactions between these factors, $F_s < 1.75, p_s > .18$. It did reveal, however, the predicted three-way interaction, $F(1, 191) = 15.40, p < .001, d = 0.57$ (see Figure 1). The measure of suppression success compares the two thought control conditions, suppression to concentration (Wegner & Erber, 1992; Wegner et al., 1993, 1997). Thus, to examine whether context congruity influenced suppression efforts, we decomposed the three-way interaction by separately analyzing the data for the two thought content conditions, comparing suppression to concentration within each.

Thought content: communication

A 2 (thought control: suppression, concentration) \times 2 (target word: evaluation, communication) mixed-model ANOVA, with target word as the within-subjects variable and RT as the dependent measure, revealed no effect of thought control, $F(1, 94) = 3.16, p = .08$, or target word, $F(1, 94) = 0.22, p = .64$, but did reveal the predicted interaction between these factors, $F(1, 94) = 4.08, p = .046, d = 0.42$. Participants who suppressed thoughts of communication were slower to

respond to the word *communication* ($M = 729.95$ ms, $SD = 122.09$) than were those who concentrated on communication ($M = 675.15$ ms, $SD = 123.26$), $t(94) = 2.19, p = .03, d = 0.45$. There were no differences in speed to respond to *evaluation* between participants who suppressed thoughts of communication ($M = 715.04$ ms, $SD = 127.18$) and those who concentrated on communication ($M = 684.48$ ms, $SD = 112.27$), $t(94) = 1.25, p = .21$.

The context of the study was evaluative, which created a context-content mismatch in the *communication content* conditions. We predicted that such a mismatch should lead to established hyperaccessibility effects, as it does not provide an external source for which to attribute suppression failures. Indeed, participants who suppressed thoughts of communication showed interference when responding to *communication*, relative to those who concentrated on communication, but there were no differences between these two groups in speed to respond to *evaluation* (which should not show differences across suppressing vs. concentrating on communication). This suggests that when the suppression context (evaluation) does not match suppression content (communication), suppression leads to hyperaccessibility. This finding replicates previous research on hyperaccessibility during suppression within a Stroop interference paradigm (e.g., Wegner & Erber, 1992; Wegner et al., 1993).

Thought content: evaluation

A 2 (thought control: suppression, concentration) \times 2 (target word: evaluation, communication) mixed-model ANOVA, with target word as the within-subjects variable and RT as the dependent measure, revealed no effect of thought control, $F(1, 97) = 0.001, p = .98$, or target word, $F(1, 97) = 1.31, p = .26$, but did reveal an interaction between these factors, $F(1, 97) = 11.88, p = .001, d = 0.70$. Although there was a significant interaction, follow-up paired t tests that tested for suppression success did not attain statistical significance: Participants who suppressed thoughts of evaluation were slower to respond to *evaluation* ($M = 696.73$ ms, $SD = 127.09$) than were those who concentrated on evaluation ($M = 671.60$ ms, $SD = 124.97$), but this difference did not reach significance, $t(97) = 0.99, p = .32$.² There was also no significant difference in responding to *communication* between participants who suppressed thoughts of evaluation

²The two-way interaction was produced by those concentrating on evaluation responding quicker to evaluation words than communication words, $p = .001$, whereas the opposite was the case for those suppressing evaluation, $p = .13$. As described in the main text and prior work, however, comparison between those concentrating on and suppressing a construct (for the matching target word) is the appropriate comparison for the hypothesis under examination (i.e., this is the test for suppression success; Wegner & Erber, 1992; Wegner et al., 1993).

($M = 680.44$ ms, $SD = 118.25$) and those who concentrated on evaluation ($M = 704.04$ ms, $SD = 138.35$), $t(97) = 0.91$, $p = .37$.

No significant effect of differential interference was found for evaluation. Here, a match existed between suppression context (evaluation) and suppression content (evaluation), allowing for external attributions for suppression failures. In sum, in a relatively evaluative context, suppressing, relative to concentrating on, communication (i.e., a suppression context-content mismatch) led to significant interference effects. Yet, there was no evidence (despite a large sample size and a conservative test for suppression failure) that suppressing, relative to concentrating on, thoughts of evaluation in an evaluative context (i.e., a suppression context-content match) led to intrusive thoughts of evaluation.

General Discussion

In Study 1, we sought to minimize the evaluative nature of the task during thought suppression of evaluation. In that study, participants who attempted to suppress thoughts of evaluation did indeed have more concurrent intrusive thoughts of evaluation, relative to participants who were not instructed to avoid thoughts of evaluation. Thus, suppressing thoughts of evaluation, like other constructs, can lead to paradoxically intrusive thoughts during suppression (Wegner, 1994), but this occurred specifically when the suppression context did not match the suppression content.

In contrast, in Study 3, we aimed to maximize the evaluative nature of the task in several ways. The need to be both accurate and quick in the Stroop task was emphasized (this was rated as evaluative in pretesting; Study 1). Moreover, suppression was especially difficult as participants were required to memorize a nine-digit number, making participants more likely to fail as demonstrated by previous work using this sensitive measure of thought accessibility (Wegner & Erber, 1992; Wegner et al., 1993; for a review, see Wegner, 1994). And yet, with a sensitive implicit measure, participants who attempted to suppress (vs. concentrate on) thoughts of evaluation did not exhibit interference when responding to the word evaluation. Thus, when there was a match between suppression context and content, this facilitated successful suppression efforts. Within the same design, there was a mismatch condition as well. And indeed, when participants attempted to suppress (vs. concentrate on) thoughts of communication (i.e., irrelevant to the evaluative context), they did demonstrate ironic accessibility of communication (i.e., the established interference effect; Wegner & Erber, 1992; Wegner et al., 1993).

Study 2 suggests an explanation for this diverging pattern of findings. When suppressing evaluation in a nonevaluative context (such as in Study 1), this suppression context-content mismatch does not allow for external attributions

for intrusive thoughts to be made, which makes concurrent thought suppression more likely to fail, a likely consequence of internal attributions being made instead, motivating thoughts of evaluation (Förster & Liberman, 2001). Conversely, suppressing evaluation in an evaluative context prompts more external than internal attributions for intrusive thoughts of evaluation, and suggesting external attributions for thought suppression difficulty leads to more successful suppression. Indeed, when the context was evaluative (a suppression context-content match), no significant interference effects were evident—even with conditions that were likely to lead to finding interference effects (i.e., cognitive load, a sensitive implicit measure, a large sample size; Study 3). Thus, when participants were in an evaluative context, they had a readily apparent reason for resulting thoughts of evaluation while suppressing thoughts of evaluation (they were in an evaluative context). This external attribution might have reduced inferences that participants wanted to think of evaluation, resulting ultimately in fewer thoughts of evaluation.

We established this causal chain across three studies, rather than in one study, because of the difficulties inherent in doing so; for instance, measuring and manipulating attributions to suppression failures while also measuring suppression failures. In cases such as this, an experimental-causal-chain design is seen as preferable to a measurement-of-mediation design (see Spencer et al., 2005). Future work, however, would benefit from measuring components of this causal chain simultaneously (e.g., measuring attributions while manipulating the evaluative nature of the task) to better understand the mechanism behind the present results.

We suggest that the results of Study 2, in particular, provide good support for an attribution mechanism behind the current results, wherein manipulating attributions for suppression failure, internal versus external, influenced suppression success while suppression attempts were ongoing. Suggesting an internal source for suppression failures increased suppression failures, whereas providing an external source for suppression failures reduced suppression failures. This perhaps explains why when in a relatively nonevaluative context such as in Study 1, suppression failures of evaluation were evident. That context did not allow for external attributions for suppression failure to the same extent as did the context in Study 3.³

Another possibility, however, is that context-content mismatches impose greater demands on cognitive resources, which therefore increases suppression difficulty, ultimately

³We note that while the context in Study 1 was less evaluative than the context in Study 3, it is more evaluative than the context used to examine attributions made for thoughts of evaluation in Study 2.

resulting in more suppression failures.⁴ The current pattern of results fits this proposal as well, as suppressing thoughts of evaluation in an evaluative context was more successful than suppressing thoughts of evaluation in a less evaluative context. While Study 2 suggests a clear role for attributions in the current work (as those results were dependent on manipulated attributions), the possibility that context-content mismatches hurt suppression efforts by also imposing a cognitive load could promise to reconcile the two different proposals for suppression failure.

The *ironic monitoring model* of suppression suggests that two processes operate during suppression attempts: a controlled process searching for other thought content, and an automatic monitor searching for suppression failures (i.e., thoughts of the suppression content; Wegner, 1994). The automatic monitor increases the accessibility of the thought content being suppressed, and when under cognitive load, the controlled process is less successful in searching for distracters from accessible suppression content. This *priming-related accessibility* model is distinct from the *motivation-related accessibility* model that we have drawn from the current work (cf. Förster & Liberman, 2001; Liberman & Förster, 2000; Wegner, 1994; see Förster & Liberman, 2004). Researchers (e.g., Förster & Liberman, 2004) have called for work examining how multiple mechanisms such as those proposed by the two different accounts might interact in causing suppression failures. Shifting focus toward ongoing suppression attempts (rather than post-suppression outcomes), while also examining suppression context-content matches versus mismatches, could hold promise to help disentangle the multiple determinants behind suppression failures, thereby finding the conditions needed for successful suppression efforts.

Conclusion

The present work suggests that the consequences of willful suppression may be moderated by context. Suppression of evaluation is especially relevant to real-world outcomes—particularly to individuals with performance anxiety. This work also has the potential to help explain previous inconsistencies in the thought suppression literature, particularly those within clinical psychology (see Abramowitz et al., 2001; Purdon, 1999). For instance, in one study, participants were

better able to suppress thoughts related to social anxiety when previously induced to be anxious, relative to participants who did not undergo an anxiety induction (Coughe, Smits, Lee, Powers, & Telch, 2005). Rather than disrupting thought suppression, an anxiety context might have provided an external attribution for initial suppression failures of social anxiety, ultimately improving thought suppression efforts. To provide another related example, while cognitive-behavioral models of social phobia suggest that individuals with social phobia have difficulty disengaging from social threat, they were better able to successfully suppress social threat stimuli than individuals without social phobia (Kingsep & Page, 2010). Again, knowledge of having social phobia might have provided a suppression context-content match, reducing inferred motivation to think of social threat, and consequently thoughts of social threat.

This preliminary evidence that suppression context can influence online thought suppression should spur additional work. Future work, for instance, could examine the suppression of evaluation in other consequential contexts (e.g., test taking, musical performance, sports) to determine if suppression of evaluation can be beneficial to performance in such contexts. Other work could compare suppressing thoughts of evaluation to expressing, to another, one's concern with evaluation (see Pennebaker, 1993; Slepian, Masicampo, & Ambady, 2013; Smyth, 1998). Additionally, other work could examine the long-term benefits of successful suppression during suppression context-content matches. Perhaps over time this short-term suppression success could support the accrual of adaptive suppression strategies, enhancing successful suppression efforts in other contexts. Additionally, future work should determine whether the effects of context on the likelihood of successful thought suppression generalize to other constructs when external attributions about suppression difficulties are relevant.

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References

- 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.
- Baumeister, R. F. (1984). Choking under pressure: Self-consciousness and paradoxical effects of incentives on skillful performance. *Journal of Personality and Social Psychology, 46*, 610–620.
- Beilock, S. L., & Carr, T. H. (2001). On the fragility of skilled performance: What governs choking under pressure? *Journal*

- of *Experimental Psychology: General*, 130, 701–725.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1–62). New York: Academic Press.
- Buhrmester, M. D., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3–5.
- Cogle, J. R., Smits, J. A. J., Lee, H.-J., Powers, M. B., & Telch, M. J. (2005). Singular and combined effects of thought suppression and anxiety induction on frequency of threatening thoughts: An experimental investigation. *Cognitive Therapy and Research*, 29, 525–539.
- Förster, J., & Liberman, N. (2001). The role of attribution of motivation in producing postsuppressional rebound. *Journal of Personality and Social Psychology*, 81, 377–390.
- Förster, J., & Liberman, N. (2004). A motivational model of postsuppressional rebound. *European Review of Social Psychology*, 15, 1–32.
- Hardy, L., Mullen, R., & Jones, G. (1996). Knowledge and conscious control of motor actions under stress. *British Journal of Psychology*, 87, 621–636.
- Hoyt, H. A., Nemeroff, C. J., & Huebner, D. M. (2006). The effects of HIV-related thought suppression on risk behavior: Cognitive escape in men who have sex with men. *Health Psychology*, 25, 455–461.
- Kenny, D. (2005). Performance anxiety: Multiple phenotypes, one genotype? Introduction to the special edition on performance anxiety. *International Journal of Stress Management*, 12, 307–311.
- Kingsep, P., & Page, A. (2010). Attempted suppression of social threat thoughts: Differential effects for social phobia and healthy controls? *Behaviour Research and Therapy*, 48, 653–660.
- Lavy, E. H., & van den Hout, M. A. (1990). Thought suppression induces intrusions. *Behavioural Psychotherapy*, 18, 251–258.
- Lepore, S. J., & Helgeson, V. (1998). Social constraints, intrusive thoughts, and mental health in prostate cancer survivors. *Journal of Social and Clinical Psychology*, 17, 89–106.
- Liberman, N., & Förster, J. (2000). Expression after suppression: A motivational explanation of postsuppressional rebound. *Journal of Personality and Social Psychology*, 79, 190–203.
- MacLeod, C. M. (1991). Half a century of research on the Stroop effect: An integrative review. *Psychological Bulletin*, 109, 163–203.
- Macrae, C. N., Bodenhausen, G. V., Milne, A. B., & Jetten, J. (1994). Out of mind but back in sight: Stereotypes on the rebound. *Journal of Personality and Social Psychology*, 67, 808–817.
- McKenna, F. P., & Sharma, D. (1995). Intrusive cognitions: An investigation of the emotional Stroop task. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21, 1595–1607.
- Najmi, S., Wegner, D. M., & Nock, M. K. (2007). Thought suppression and self-injurious thoughts and behaviors. *Behaviour Research and Therapy*, 45, 1957–1965.
- Pennebaker, J. W. (1993). Putting stress into words: Health, linguistic, and therapeutic implications. *Behavior Research and Therapy*, 31, 539–548.
- Purdon, C. (1999). Thought suppression and psychopathology. *Behaviour Research and Therapy*, 37, 1029–1054.
- Rassin, E., Merkelbach, H., & Muris, P. (1997). Effects of thought suppression on episodic memory. *Behaviour Research and Therapy*, 35, 1035–1038.
- Robinson, M. D. (2007). Lives lived in milliseconds: Using cognitive methods in personality research. In R. W. Robins, R. C. Fraley, & R. F. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 345–359). New York: Guilford Press.
- Slepian, M. L., Masicampo, E. J., & Ambady, N. (2013). Relieving the burdens of secrecy: Revealing secrets influences judgments of hill slant and distance. *Social Psychological and Personality Science*. doi:10.1177/1948550613498516.
- Slepian, M. L., Masicampo, E. J., Toosi, N. R., & Ambady, N. (2012). The physical burdens of secrecy. *Journal of Experimental Psychology, General*, 141, 619–624.
- Smyth, J. M. (1998). Written emotional expression: Effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology*, 66, 174–184.
- Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, 89, 845–851.
- Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review*, 101, 34–52.
- Wegner, D. M., Broome, A., & Blumberg, S. J. (1997). Ironic effects of trying to relax under stress. *Behaviour Research and Therapy*, 35, 11–21.
- Wegner, D. M., & Erber, R. (1992). The hyperaccessibility of suppressed thoughts. *Journal of Personality and Social Psychology*, 63, 903–912.
- Wegner, D. M., Erber, R., & Zanakos, S. (1993). Ironic processes in the mental control of mood and mood-related thought. *Journal of Personality and Social Psychology*, 65, 1093–1104.
- Wegner, D. M., Schneider, D. J., Carter, S., & White, T. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology*, 53, 5–13.