

Analysis of the Efficacy of Different Thought Suppression Strategies

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ABSTRACT

Some researches have demonstrated that when one wants to suppress a thought, it is paradoxically the first thing that comes to mind. However, subsequent studies on this topic have pointed out that successful thought suppression depends on the specific strategy employed to deal with the unwanted thought. The present study examined the impact of different thought suppression instructions on the frequency and appraisals of memories about the March 11 attacks that took place in 2004 in Madrid. Thus, 120 undergraduates were randomly allocated to the following experimental conditions: thought suppression, thought suppression with focused distraction, thought suppression confronting a reminder, and monitor-only. Data analysis showed an absence of paradoxical effects, that is, neither immediate nor delayed frequency increases of the target thought. Furthermore, those participants instructed to use focused distraction reported less intrusions than those from the control condition at short and long-term. Finally, the results are discussed in relation to previous studies on thought control.

Keywords: Thought suppression, Intrusive thoughts, Paradoxical effects, Mental control.

RESUMEN

Algunos estudios han demostrado que cuando alguien intenta suprimir un determinado pensamiento, paradójicamente es este pensamiento lo primero que viene a la mente. No obstante, varios estudios posteriores sobre este tema han señalado que la supresión exitosa de un pensamiento depende en gran medida de la estrategia específica de control mental que se ha empleado. Así, el presente estudio examinó el impacto de diferentes instrucciones de supresión en la frecuencia y valoraciones realizadas sobre recuerdos de los ataques terroristas del 11-M que tuvieron lugar en Madrid en 2004. Con este objetivo, 120 estudiantes fueron asignados aleatoriamente a las siguientes condiciones experimentales: supresión, supresión con distracción focalizada, supresión con visualización de un estímulo recordatorio, y monitorización. Los análisis estadísticos mostraron una ausencia de efectos paradójicos, es decir, no se encontró un aumento inmediato o demorado de la frecuencia de los pensamientos y/o recuerdos suprimidos. Además, aquellos participantes instruidos a emplear la distracción focalizada informaron de un menor número de intrusiones a corto y largo plazo que los sujetos de la condición control. Finalmente, los resultados son discutidos en relación con los estudios previos sobre control del pensamiento.

Palabras clave: supresión de pensamiento, pensamientos intrusos, efectos paradójicos, control mental.

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The more one wants to eliminate certain unpleasant or inopportune intrusive thoughts, the more frequently and intensely they come to mind. This was the conclusion obtained from the “white bear” study carried out by Wegner, Schneider, Carter, and White (1987). In this study participants in the initial suppression condition were told to suppress the thoughts of white bears and express these thoughts in a second period. In the initial expression condition, this instruction was reversed. The authors observed a rebound effect, that is, a significant increase in thoughts of a white bear after first having suppressed this thought. Therefore, it was demonstrated not only that thought suppression is a difficult task, but also it can be counterproductive.

Nevertheless, many subsequent studies have failed to replicate the rebound effect (for a review see Abramowitz, Tolin, & Street, 2001; Wenzlaff & Wegner, 2000). In fact, Abramowitz *et al.* (2001) conducted a meta-analysis of 28 controlled studies on this topic that yielded only a small to moderate rebound effect of thought suppression. Thus, some studies have obtained the “initial enhancement effect” (e.g. Markowitz & Borton, 2002; Salkovskis & Campbell, 1994; Trinder & Salkovskis, 1994), some have found the rebound effect (e.g. Davies & Clark, 1998; Harvey & Bryant, 1998; McNally & Ricciardi, 1996), and some others none of them (e.g. Borton, 2002; Kelly & Kahn, 1994; Roemer & Borkovec, 1994).

In light of these contradictory findings across studies, researchers have recently oriented their efforts towards the study of the factors that could determine the successful suppression of unwanted thoughts and memories. Thus, we possess enough evidence to affirm that the precise technique used to suppress the unpleasant thought is of crucial importance. In fact, some studies have indicated that when suppression is combined with focused distraction the individual successfully eliminates the unwanted thoughts that are invading his mind. For instance, in the Wegner's *et al* (1987) study, participants were told “...to verbalize your thoughts as you did before, with one exception. This time, try not to think of a white bear” (p. 6-7). But, despite these instructions, Wegner and collaborators noted that some participants used focused distraction when they were told to suppress, showing less white bear intrusions. Thus, in a second experiment in order to explore the powerful effects of distraction, one group of participants was instructed to use a distracter thought (a red Volkswagen) when trying to suppress the target intrusions. Results indicated the absence of a rebound effect in this condition. In line with this, Salkovskis and Campbell (1994) were also interested in the effects of different thought suppression techniques. The most frequent intrusive thoughts of the participants were identified to be used as target thoughts, and then subjects were allocated to different experimental conditions: suppression instructions, suppression instructions with general distraction instructions, suppression instructions with a specific distraction task, suppression instructions with general “don't distract” instructions, and control instructions. The use of suppression and suppression with general distraction was significantly associated with an immediate increase of naturally occurring intrusive thoughts, whereas those subjects instructed to employ focused distraction reported a low number of intrusions, demonstrating that distraction can play an important moderating role. These findings are in line with recent theories on mental control based on postconscious processes (for a review see Dorris & Moran, 2005), which posit that

there are strategies (e.g. suppression) that prime the thought one wants to erase from consciousness, provoking at long-term more preoccupation with it, and others that prime alternative stimuli, making the target thought less accessible (e.g. distraction).

The suppression with focused distraction strategy has similarities with the technique employed to suppress in the “think-no think” task, which was recently developed by Anderson and collaborators (Anderson & Green, 2001; Anderson *et al.*, 2004) to study the inhibition of unwanted memories. In the first phase of this task, subjects are instructed to study a list of word pairs that are emotionally neutral. Then, during the think-no think phase, participants are presented with one member of a pair and asked either to recall and think about the associated response (respond condition) or to prevent the associated word from entering consciousness at all (suppression condition). Finally, participants’ memories are tested after a brief delay. Anderson and colleagues showed that suppression caused significant forgetting, that is, recall of suppressed items was worse than baseline items (baseline items are studied pairs that are not presented during the think-no think phase). These findings suggest that people can inhibit an unwanted memory while confronting reminders of the memory they are trying to suppress. Some subsequent studies employing the think-no think paradigm have provided only partial support for the findings of Anderson (see Algarabel, Luciano, & Martínez, 2006; Joorman, Hertel, Brozovich, & Gotlib, 2005; Wessel, Wetzels, Jelicic, & Merckelbach, 2005). In a recent study, Hertel and Calcaterra (2005), employing the think-no think paradigm have shown that when substitute targets are provided during the suppression (no think) phase, the level of forgetting is higher. These authors instructed a group of undergraduates to learn a list of adjective-noun pairs. Then the adjectives were administered as cues for recalling half of the nouns and cues for the suppressing the other half. There were two suppression conditions. Some subjects were instructed to see the cue (the reminder), but to avoid saying or thinking about the associated response word (unaided suppression condition), whereas other subjects were told to think about experimentally provided nouns in order to avoid the original associated response (aided suppression condition). Finally, all participants were asked to recall the original response noun for each cue. Results revealed a significant inhibitory effect only in the aided suppression condition. Additionally, those participants from the unaided suppression condition who spontaneously employed focused distraction then reported levels of forgetting similar to those obtained in the aided condition, which is also an important indicator of the effectiveness of thought substitution, that is, suppression focusing the attention in a reminder is possible, but the availability of a single distracter increases the suppression effects.

The first attempt to adapt the type of suppression proposed by Anderson and collaborators to thought suppression research was recently made by Luciano and Algarabel (in press). In this study, the participants were instructed to monitor the presence of a thought during three periods. During the second period, one of the groups was instructed to suppress the target thought confronting a reminder stimulus of the target, another group received the classic suppression instructions, and finally, one group received monitor-only instructions. Results revealed an absence of paradoxical effects on thought frequency. But, those participants that had received classic suppression instructions presented at long-term the same discomfort level reported at baseline period, whereas

those individuals instructed to suppress confronting a reminder or received monitor-only instructions were then less disturbed or emotionally affected by the occurrence of the target thought. This finding suggests that direct suppression is counterproductive due to it interferes the natural habituation process, whereas the type of suppression adapted from Anderson and collaborators seems effective and beneficial from an emotional point of view.

Taking into account the aforementioned studies and using the thought suppression paradigm, the main purpose of the present research is to know which thought suppression strategy is more effective for the control of unpleasant intrusive thoughts: thought suppression-only, thought suppression with focused distraction or thought suppression confronting a reminder stimulus. Although the clinical literature (see Abramowitz *et al.*, 2001) shows inconsistency of results regarding the effect of the emotional valence and personal relevance of the target thought on suppression, we selected the March 11th terrorist attacks that took place in Madrid (Spain) in 2004 as target thoughts, rather than the typical experimentally-provided neutral thoughts (e.g. white bear).

METHOD

Participants

A total of 120 undergraduate students from the University of Valencia (Spain) volunteered to participate in this study in exchange for course credit. The gender composition of the sample was 85.8% female and 14.2% male. Their age ranged from 18 to 48 with a mean age of 22.2 years ($SD= 3.52$). All subjects gave informed consent to participate in the research.

Measures

Visual Analogue Scales (VAS). Three visual analogue scales were computer-administered to get information about the subject's experience to the target thought,

- *Annoyance caused by the intrusion*: After completing each stage of the experiment, the participants were asked to indicate the disturbance caused by the intrusions during the prior 5 min (from 0 "Not at all", to 9 "Extremely annoying"). This measure was interesting in order to assess an important aspect of the emotional reaction to the intrusions.
- *Suppression effort*. After the three experimental periods, all participants were asked how hard they tried to get rid of the thought during the corresponding period (from 0 "Not at all", to 9 "Very much"). This measure is useful to assess the tendency to spontaneously suppress in the absence of explicit instructions to do so.
- *Suppression difficulty*: Following the second period, the three suppression groups answered the following question: "To what extent has it been difficult to you the suppression of the target thought during this last period?" (from 0 "not very difficult", to 9 "Extremely difficult"). With this question we obtained a subjective estimation of the difficulty on the suppression task, which may be determined by the strategy used to suppress.

Apparatus and Materials

Desktop computers running E-Prime v 1.0 software (Schneider, Eschman, & Zuccolotto, 2002) were used to record subjects' responses via keypress. We selected eight colour photographs from a Spanish newspaper ("La Razón") on the web to activate the memories about the March 11 attacks. The pictures showed trains smashed by the bombs, policemen helping injured people, cadavers covered with a sheet, etc. Two additional colour pictures showing the hall of the faculty of psychology and the principal railway station of the city were employed in the experiment, to be used as distracter and as reminder of the target respectively.

Procedure

Participants came in groups of eight to a sound-attenuated laboratory and were seated in front of the computer individually. Prior to the experiment, participants were randomly assigned to one of four experimental groups: thought suppression (n= 29), thought suppression with distraction (n= 28), thought suppression confronting a reminder (n= 29) or monitor-only (n= 34). To further activate the target thought, the experimenter instructed participants to look at the pictures about the March 11 attacks that were going to appear on the computer. Thus, the experiment began with the presentation of the 8 pictures described above, which were displayed one at a time on the center of the screen of the computer for 5 seconds. Then, participants carried out the thought suppression task, which was divided into three 5 min thought-monitoring phases. During each of the periods, target thought occurrences were recorded by pressing the "space bar". The cover "event marking" procedure is more recommendable than other thought recording methods that can provoke more compliance with the experimental instructions (e.g., the stream of consciousness). The lights were dimmed and the research assistant was out of view of the subjects but remaining in the laboratory whilst the thought suppression task was carried out. During all periods, subjects registered their target thought occurrences with closed eyes and in absolute silence.

Period 1. All participants listened to and read the following instructions: "*During the following minutes, you may think about anything that you like. If at any time you think about the March 11 attacks, please press the space bar. Don't try to suppress any thought*". After period 1, all experimental groups completed the VAS of annoyance and suppression effort.

Period 2. On the one hand, participants from "suppression with distraction" and "suppression confronting a reminder" were shown a picture from the "hall of the faculty" and from the "railway station of the city" respectively. The pictures appeared on the center of the screen for 1 min. Next, both groups received the following instructions: "*During the next minutes, you have to mentally visualize -the hall of the faculty (the distracter)/the railway station (the reminder). But now, it is very important that you try as hard as you can not to think about the March 11 attacks. If at any time you think about the March 11 attacks, please press the space bar*". On the other hand, participants from the suppression group were given the following instructions: "*During the next minutes, you may think about anything that you like. But now, it is very important that you try as hard as you can not to think about the March 11 attacks.*"

If at any time you think about the March 11 attacks, please press the space bar". The control group were given instructions similar to those used in the previous period. Afterwards, all experimental groups completed the VAS of annoyance and suppression effort for a second time. The three suppression groups also completed the VAS of suppression difficulty.

Period 3. Finally, all participants received instructions similar to those used in period 1. Once the period finished, all experimental groups were administered again the VAS of annoyance and suppression effort. Following the thought suppression task, participants were thanked for their participation and debriefed.

RESULTS

Data from 9 subjects were discarded for being outliers. We eliminated those subjects with a target thought frequency greater than or equal to three standard deviations above their group mean during one or more periods. In addition, we discarded 1 subject from the control group because she did not press the space bar during any experimental period. Both exclusion criteria (outliers and subjects with 0 target thought occurrences), initially proposed by Janeck and Calamari (1999), have been used in several researches (e.g. Belloch, Morillo, & Giménez, 2004; Luciano & Algarabel, in press; Purdon & Clark, 2001). Scores were subjected to a square root transformation in order to normalize the positively skewed data distributions. Because some values were zero, $Y = Y + (Y + 1)$ was used as the transformation formula (see Kirk, 1968). For clarity, the means and standard deviations indicated in Table 1 are not transformed. Effect sizes are reported on all the analyses and are based on partial η^2 .

The thought frequency data for the four groups were analysed using a 4 (Group: suppression+reminder, suppression+distraction, suppression and monitor-only) x 3 (Period: periods 1, 2 and 3) mixed factorial ANOVA. The statistical analysis yielded a significant main effect for period, $F(2,212) = 119.65$, $p < .001$, $\eta^2 = .53$ and for group, $F(3,106) = 13.76$, $p < .001$, $\eta^2 = .28$. No other significant effects were found, so we can conclude that subjects from the monitor-only condition reported higher number of intrusions than the suppression groups regardless of period and that intrusion frequencies decreased across periods regardless of condition.

Table 1. Frequency of target intrusions across the three periods of the experiment in the four groups of participants (non transformed data).

	n	Period 1	Period 2	Period 3
Suppression + Reminder	27	10.44 (6.51)	4.67 (3.99)	3.81 (3.50)
Suppression + Distraction	26	7.85 (4.18)	3.15 (3.09)	2.38 (3.52)
Suppression	27	10.33 (6.99)	4.07 (3.50)	3.96 (4.35)
Monitor-only	30	18.37 (12.24)	13.67 (11.24)	10.30 (9.47)

Between-subjects planned comparisons were next conducted. The groups differed significantly in the number of intrusive thoughts during the baseline period, $F(3,106) = 7.26$, $p < .001$, $\eta_p^2 = .17$). Post-hoc comparisons indicated that the monitor-only group presented higher number of intrusions than the suppression+reminder ($p < .05$), suppression+distraction ($p < .01$) and suppression ($p < .05$) group. In order to explore whether there were initial enhancement and rebound effects of suppression, one-way analyses of covariance were carried out using frequency of target intrusions during the period 1 as a covariate. Thus, the data analysis of the second period showed again significant differences, $F(3,105) = 7.40$, $p < .001$, $\eta_p^2 = .17$) between the monitor-only group and the three suppression groups (all p 's $< .01$). Finally, during the third period, it was found that only the suppression + distraction group reported significantly less intrusions ($p < .03$) than the monitor-only group, $F(3,105) = 3.18$, $p < .03$, $\eta_p^2 = .08$). Therefore, there was no evidence of initial enhancement or rebound effects. In fact, the present results clearly reveal an immediate decrease of intrusions when subjects are instructed to suppress and a delayed decrease only when suppression is combined with focused distraction.

Mean scores and standard deviations on the three VAS (annoyance, effort and difficulty) across group and experimental period are displayed in Table 2. The data were not transformed because they were normally distributed.

In order to determine whether participants complied the suppress or non suppress instructions and to assess the effectiveness of the experimental manipulation, a 4 (Group: suppression+reminder, suppression+distraction, suppression and monitor-only) \times 3 (Period: periods 1, 2 and 3) mixed factorial ANOVA was carried out on subjects ratings. It was obtained a significant main effect for period, $F(2,212) = 77.91$, $p < .001$, $\eta_p^2 = .42$). But, this effect was qualified by a significant interaction, $F(6,212) = 7.58$, $p < .001$, $\eta_p^2 = .17$). Follow-up analyses showed that during the second period, those subjects not instructed to suppress reported less effort, $F(3,106) = 6.52$, $p < .001$, $\eta_p^2 = .16$, than those who suppressed confronting a reminder ($p < .001$), suppressed employing a distractor ($p < .01$) or simply suppressed ($p < .05$). No significant effects were obtained during the first or third period.

Table 2. Means (and Standard Deviations) of Annoyance Associated with the Target Intrusions, Suppression Effort and Difficulty across experimental groups and periods.

	n	Period 1		Period 2			Period 3	
		Annoyance	Effort	Annoyance	Effort	Difficulty	Annoyance	Effort
Suppression + Reminder	27	5.78 (1.78)	5.11 (2.46)	5.37 (1.98)	5.96 (2.36)	5.44 (2.06)	3.85 (1.88)	3.30 (2.07)
Suppression + Distraction	26	5.38 (2.16)	5.19 (2.33)	4.08 (2.65)	5.35 (2.76)	4.77 (2.47)	2.58 (2.23)	2.88 (2.60)
Suppression	27	5.37 (2.20)	6.07 (1.86)	4.00 (2.91)	5.04 (2.77)	4.41 (2.61)	3.19 (2.27)	2.63 (2.15)
Monitor-only	30	5.37 (2.30)	6.03 (2.79)	4.23 (2.32)	3.10 (2.52)		3.30 (2.38)	2.67 (2.47)

With the aim to assess whether different types of suppression provoke different emotional reactions, a 4 (Group: suppression+reminder, suppression+distraction, suppression and monitor-only) x 3 (Period: periods 1, 2 and 3) mixed factorial ANOVA was conducted on subjects ratings. Data analysis yielded only a main effect for period, $F(2,212) = 65.91$, $p < .001$, $\eta_p^2 = .38$. Our results indicate that all subjects reported experiencing less annoyance associated with the intrusions over time regardless of experimental condition. Planned comparisons showed an absence of significant differences between groups in all experimental periods (all p 's $> .05$).

Subjects reports of how difficult had been to erase intrusive thoughts from the mind during the second period were analysed using a one-way analysis of variance, which yielded a non significant effect, $F(2,77) = 1.31$, $p > .05$, $\eta_p^2 = .03$). This null effect suggests that the employment of a distractor or a reminder does not necessarily make the suppression task easier.

DISCUSSION

The primary purpose of the present study was to compare the efficacy of three different suppression strategies for the management of unpleasant intrusive thoughts. The results can be summarized as follows. First, the suppression instructions did not increase the occurrences of the target thought, that is, we did not find paradoxical effects (immediate enhancement or rebound effect) on frequency or annoyance. Instead of paradoxical effects, we found that the three suppression methods proved in our study were effective at short-term, because they caused a significant decrease in the number of intrusive thoughts during the second experimental period. Second, the analysis of the third period indicated that suppression with focused distraction seems a recommendable thought control strategy at long-term, because the participants instructed to use this strategy during the prior period reported significantly less intrusions than those who had simply received monitor instructions.

The absence of paradoxical effects is not an unusual result if we remember some earlier studies that have employed target thoughts with negative emotional valence. For instance, Roemer and Borkovec (1994) explored the concurrent and subsequent effects of suppression of material with different emotional valence, using neutral, anxious and depressing target thoughts. The main hypothesis was that negative emotional material would be more difficult to suppress than neutral material and would lead to a greater rebound effect. However, the results were opposite to the initial enhancement and rebound effect. Participants suppressed the target thoughts regardless of emotional valence.

Another key finding of the present research is the beneficial effects at short and long-term produced by distraction. Our results are in concordance with the aforementioned thought suppression researches conducted by Salkovskis and Campbell (1994) and Wegner *et al.* (1987; experiment 2). Furthermore, the clinical literature provides some examples of the positive influence of distraction. A study conducted by Harvey and Payne (2002) pointed out that distraction reduces the sleep onset latency of people with severe sleep problems. Amir, Cashman, and Foa (1997) found that healthy subjects employ distraction more often than obsessive-compulsive patients. Some years later,

Abramowitz, Whiteside, Kalsy, and Tolin (2003) replicated and extended these findings. These authors applied a cognitive-behavioural treatment to obsessive compulsive patients and it was interesting to see how the treatment based on exposure and response prevention caused a significant increase in the use of distraction. Recently, Coles and Heimberg (2005) pointed out that individuals with a generalized anxiety disorder report lower use of distraction than normal controls. Additionally, greater use of distraction was positively associated with higher life satisfaction. In conclusion, we have enough evidence to affirm that the provision of adequate distractors seems more effective than the instruction to suppress or the instruction to suppress confronting a fear-evoking situation. Therefore, the use of distraction seems a highly constructive style of managing unpleasant thoughts and memories.

Finally, it is important to point out that other strategies or techniques like acceptance might be more recommendable than focused distraction from a therapeutic point of view. One of the purposes of the acceptance approach (see Hayes, Strosahl, & Wilson, 1999) is to change the goal from suppression of unpleasant thoughts and emotions to fully experiencing them with the end of achieving personally valued goals. In sum, this perspective posits that the continuous attempts of emotional control are harmful. Marcks and Woods (2005) experimentally demonstrated that an acceptance-based approach is more recommendable than thought suppression to deal with intrusive thoughts. These authors carried out two studies to compare not only the consequences of acceptance and suppression on the management of personally relevant intrusive thoughts, but also their association with psychopathological symptoms. Consistent with their hypotheses, they found in the first study a significant positive association between the effort to suppress the target thought, the frequency of target intrusions and the discomfort associated with the intrusions. Conversely, acceptance showed a negative relationship with intrusions frequency and discomfort, depressive symptomatology, obsessive-compulsive complaints and trait anxiety. The experiment conducted in the second study revealed an immediate enhancement effect on thought frequency and a rebound effect on discomfort for the thought suppression condition, whereas the group that received acceptance instructions manifested a significant decrease in discomfort level. These results suggest that acceptance is a very effective technique for thought management because it changes the way the intrusions are experienced in a positive fashion. In our opinion, future researches should address whether an acceptance based approach is also more effective than suppression with focused distraction, having in mind that efficacy does not mean only a decrease in the number of intrusive thoughts.

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