

High thought suppressors dream more of their negative waking-life experiences than low thought suppressors

Running title: Thought suppression and negative dreams

Author name and affiliation: Dr Josie Malinowski<sup>a</sup>

<sup>a</sup>School of Psychology, University of East London, London

Corresponding author: Dr Josie Malinowski, [j.malinowski@uel.ac.uk](mailto:j.malinowski@uel.ac.uk), School of Psychology, University of East London, Water Lane, Stratford, E15 4LZ, UK, +44 (0)208 223 4421

**Abstract**

Research has found that high thought suppressors dream more of their emotional waking-life experiences than low suppressors, in line with the dream rebound effect. The present study replicated and extended this finding. Participants (N=62) completed the White Bear Suppression Inventory (WBSI), the Pittsburg Sleep Quality Index (PSQI), the Depression, Anxiety, and Stress Scale (DASS21), and answered questions about their Most Recent Dream. High thought suppressors dreamt more of their negative (but not positive) emotional experiences from waking-life than low thought suppressors. They also had poorer sleep quality, and higher levels of depression, anxiety, and stress. The results indicate a negative relationship between trait thought suppression and well-being. Identifying problematic suppressed thoughts in dream content may assist in generating insights into them and/or have therapeutic benefit.

Keywords: thought suppression, thought intrusions, dream rebound, sleep quality, negative emotional states

## Introduction

Thought suppression – the attempt to ignore unwelcome thoughts – has been shown to have wide-ranging negative effects. In the research presented herein, trait thought suppression was investigated in relation to three factors: dream content, sleep quality, and negative emotional states (depression, anxiety, and stress).

The main aim of the research was to replicate and extend the findings of Malinowski (2015), in which it was found that individuals high in trait thought suppression dreamt more of their waking-life emotions than low thought suppressors. This finding was in line with the effect known as “dream rebound”: thoughts suppressed during wakefulness rebound and reappear in dreams (Bryant, Wyzenbeek, & Weinstein, 2011; Wegner, Wenzlaff, & Kozak, 2004), particularly for high thought suppressors (Taylor & Bryant, 2007).

The dream rebound effect has been replicated in a number of experiments, but none to date have investigated the effect of emotional valence (positive versus negative) on rebound. Wegner et al. (2004) found that dream rebound did not differ in terms of “emotional attraction” to the person who was the target in their experiment, but attraction is not an emotion, and could easily link with a wide variety of differently valenced emotions (e.g. happiness if the attraction is reciprocated, sadness if it is not, etc.). Furthermore, emotional attraction was determined by whether the target person was a crush or a non-crush, but non-crushes could be someone that the participant was fond of, so emotional attachment could also have been present in those relationships.

The present study addressed this question by investigating the effect of trait thought suppression on dreaming of emotional waking-life experiences, and further whether this effect was specific only to negative emotions. Intuitively, it makes sense that high suppressors would want to suppress negatively toned emotional experiences and not positively toned ones, since negative experiences would be uncomfortable and unpleasant to think about, and so would be more likely to be suppressed. As such, it was hypothesised that high suppressors would dream of negative experiences more than low suppressors, but that there would be no difference for dreaming of positive experiences.

In addition to investigating the effect of trait thought suppression on dream content, it was aimed to investigate whether it would also have negative effects on sleep quality and emotional states, as both are related to dream content. Previous research has found that sleep concerns such as insomnia are related to the attempt to suppress thoughts during wakefulness (Harvey, 2001, 2003). Likewise, there is a large body of literature that associates thought suppression with various mental health issues, such as Generalised Anxiety Disorder (Becker, Rinck, Roth, & Margraf, 1998). As such, it was also hypothesised that high suppressors would have poorer sleep quality and higher levels of depression, anxiety, and stress than low suppressors.

## Method

### *Participants*

There were 95 participants in the study; of these, 62 submitted dreams that were suitably recent for analysis (having been experienced either the night before (N=25) or within the last week (N=37)). Of these 62 participants, 44 reported their biological sex as female, 17 as male, and 1 did not specify. All participants identified their gender as matching their biological sex. Participants were mostly second year psychology students at the University of Bedfordshire (N=27); others were recruited from Reddit, Twitter, Facebook groups dedicated to research recruitment, and other social networking websites (N=18); or from word of mouth or other means (N=17). Ages ranged from 18 to 56 (M=27.82; SD=9.41). Based on a power analysis with effect size of  $r = .3$  (based on Malinowski, 2015), recruitment continued until at least 60 participants had completed the full questionnaire and submitted a dream that was a maximum of one week old.

### *Materials*

Participants were asked to recount their Most Recent Dream and answer questions about it, and complete three questionnaires, all hosted in one weblink via the online questionnaire resource Qualtrics.

The first questionnaire asked them to report their “Most Recent Dream” by following instructions that were adapted from the original MRD paradigm ([http://www2.ucsc.edu/dreams/Forms/most\\_recent\\_dreams.html](http://www2.ucsc.edu/dreams/Forms/most_recent_dreams.html)), as reported in Malinowski (2015).

Participants were then asked a series of questions about their dream:

- 1) “Thinking about this dream, how much of it do you see as being related to emotions you have experienced in waking life?” (answerable on a Visual Analogue Scale from 0 to 100, where 0=“No waking-life emotions in the dream” and 100=“The whole dream contains emotions from waking life”)
- 2) “Which of the following emotions did your dream contain? Tick all that apply” (tick boxes for happiness, sadness, anger, fear, love, anxiety, guilt, awe, and lust). Emotions were selected from Shaver, Schwartz, Kirson, and O’Conner (2001) and designed to strike a balance between positively toned and negatively toned emotions.
- 3) “To what extent does your dream relate to waking-life [happiness/sadness/anger/fear/love/anxiety/guilt/awe/lust] that you have experienced?” (answerable on a Visual Analogue Scale from 0 to 100, where 0=“Not about [emotion] from my waking life at all”, and 100=“The whole dream is about [emotion]I have experienced in waking life”). Examples were given for how a dream could relate to each emotion, e.g. participants read the example for anger, “For example, you might have dreamt about an argument or falling out you had with someone.”
- 4) “How often do you experience a recurrent dream? A recurrent dream is a dream that repeats the same content over and over again.”
- 5) “How often do you experience a lucid dream? A lucid dream is a dream in which you are aware you are dreaming, and may have some control over what happens in the dream.”
- 6) “How often do you experience a nightmare? A nightmare is a very unpleasant, often scary, dream, in which the emotion is so strong that it wakes you up.”

The next three pages of the questionnaire contained three established questionnaires:

- 1) 15-item White Bear Suppression Inventory (WBSI: Wegner & Zanakos, 1994), a questionnaire designed to measure an individual's tendency to suppress thoughts, with items such as "Sometimes I really wish I could stop thinking".
- 2) The Pittsberg Sleep Quality Index (PSQI: Buysse, Reynolds, Monk, Berman, & Kupfer, 1989), a measure of how good an individual's sleep quality is, in seven factors: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, sleep medication, and daytime dysfunction.
- 3) The Depression, Anxiety, and Stress Scale (DASS21 Lovibond & Lovibond, 1995) measures an individual's levels of depression, anxiety, and stress.

### *Procedure*

Participants either took part during a scheduled class at the University of Bedfordshire, or in their own time at home. After reading the first page in which they were informed that they would be asked to recount a recent dream and answer some questions about it as well as some other questionnaires, participants could either indicate their consent to participate or close the webpage. Students at the University of Bedfordshire were given the third option of participating in the study for their learning but refusing their data to be used in the analysis. Once consent had been obtained, participants were asked to recount their Most Recent Dream and then answer the questions about it and the three other questionnaires. All participants completed the questionnaire in the same order. Following completion of the questionnaire participants were debriefed on the nature of the study and thanked for their time. Responses were automatically recorded on Qualtrics and then downloaded for analysis in IBM SPSS software.

The study abided by the British Psychological Society's ethical guidelines, and received ethical approval from the Research Centre for Applied Psychology's Research Ethics Committee at the University of Bedfordshire.

## Results

Three sets of analyses were conducted, investigating the effects of trait thought suppression on dream content, sleep quality, and negative emotional states (depression, anxiety, and stress). The WBSI was split into its subscales (thought suppression and thought intrusions), using items that have consistently loaded onto these subscales across four studies (Schmidt et al., 2009). Both subscales were split around the median score to compare individuals who scored high in trait thought suppression and intrusions to those with low scores.

### *The effect of trait thought suppression / intrusions on dreaming of waking-life emotions*

Initial analyses were performed with trait thought suppression / intrusions, and the general “dreaming of waking-life emotions” variable, ignoring valence. As there was previous research evidencing this effect (Malinowski, 2015), analyses were 1-tailed. As parametric assumptions were met, two independent t-tests were conducted. There was a trend towards an effect of thought suppression on reported waking-life emotions in dreams, but this analysis did not reach significance  $t(55) = -1.50, p = .07, d = .40$ . There was an effect of thought intrusions on reported waking-life emotions in dream,  $t(55) = -.18, p = .03, d = .48$ , such that participants who scored high on thought intrusions reported dreaming more of their waking-life emotions ( $M = 66.45, SD = 27.53$ ) than those who scored low on thought intrusions ( $M = 52.77, SD = 29.33$ ).

The lack of significance for the first analysis may be due to the differential effects on positive and negative waking-life emotions. Separate analyses were run for these variables. Mann Whitney U tests were preferred to MANOVA due to non-normality of the dreaming of waking-life emotion variables. The Holm-Bonferroni (Holm, 1979) method of correction was applied to account for the inflated Type 1 error. As these analyses were exploratory, all were 2-tailed.

There was a significant effect of trait thought suppression on reported dreaming of waking-life sadness,  $U = 676.5, z = 2.80, p = .005, r = .36$ , anger,  $U = 641.5, z = 2.36, p = .018, r = .30$ , fear,  $U = 667, z = 2.67, p = .008, r = .34$ , and anxiety,  $U = 734, z = 3.61, p < .001, r = .46$ . There was no significant effect on reported dreaming of waking-life guilt ( $p = .21$ ), happiness ( $p = .06$ ), love ( $p = .61$ ), awe ( $p = .87$ ), or lust ( $p = .68$ ).

There was a significant effect of trait thought intrusions on reported dreaming of waking-life sadness,  $U = 636.5, z = 2.23, p = .01, r = .28$ , anger,  $U = 653.5, z = 2.54, p = .01, r = .32$ , and anxiety,  $U = 716, z = 3.35, p = .001, r = .43$ . There was no significant effect on dreaming of waking-life fear ( $p = .14$ ), guilt ( $p = .05$ ), happiness ( $p = .71$ ), love ( $p = .46$ ), awe ( $p = .41$ ), and lust ( $p = .38$ ).

See Table 1 for median scores.

[Insert Table 1 about here]

No effects were found for trait thought suppression / intrusions on lucid dream, recurrent dream, or nightmare frequency (all  $ps > .05$ ).

### *The effect of thought suppression / intrusions on sleep quality*

Analyses were planned with a global score for sleep quality based on the summation of the seven dimensions of the PSQI. However, for two of the dimensions (sleep duration and habitual sleep efficiency), and one of the items for a third (sleep latency), there was a large amount of missing data. As such, sleep duration and habitual sleep efficiency were excluded from the analysis, and sleep latency was calculated using the second measurement for which missing data did not pose a problem (item 5a). Thus the global score of sleep quality in this analysis is

based on the dimensions of subjective sleep quality, sleep latency, sleep disturbances, using sleep medication, and daytime dysfunction.

In the PSQI a higher score indicates worse sleep quality. As parametric assumptions were met, two independent t-tests were conducted. Participants who scored high in thought suppression had worse sleep quality ( $M=8.4$ ,  $SD=2.94$ ) than those who scored low in thought suppression ( $M=6.22$ ,  $SD=2.93$ ),  $t(60) = -2.93$ ,  $p = .003$  (1 tailed),  $d = 0.72$ . Likewise, participants who scored high in thought intrusions had worse sleep quality ( $M=8.6$ ,  $SD=2.70$ ) than those who scored low in thought suppression ( $M=5.76$ ,  $SD=2.87$ ),  $t(60) = -4.02$ ,  $p < .001$  (1 tailed),  $d = 1.02$ .

### *The effect of thought suppression / intrusions on mental health*

To test the hypothesis that thought suppression and intrusions would lead to more experiencing of negative emotional states, Mann Whitney U tests were performed (preferred to MANOVA due to non-normality of the DVs at the low suppression / intrusions level). The Holm-Bonferroni (Holm, 1979) method of correction was applied to account for the inflated Type 1 error. As there is strong evidence to suggest that thought suppression and intrusions are related to poorer mental health, 1-tailed analyses were chosen.

As expected, there was a significant effect of thought suppression on depression scores,  $U = 769$ ,  $z = 4.09$ ,  $p < .001$ ,  $r = .51$ , anxiety scores,  $U = 759$ ,  $z = 3.95$ ,  $p < .001$ ,  $r = .50$ , and stress scores,  $U = 765.5$ ,  $z = 4.04$ ,  $p < .001$ ,  $r = .51$ . Likewise there was a significant effect of thought intrusions on depression scores,  $U = 701.5$ ,  $z = 3.13$ ,  $p = .001$ ,  $r = .40$ , anxiety scores,  $U = 628.5$ ,  $z = 2.10$ ,  $p < .017$ ,  $r = .27$ , and stress scores,  $U = 720.5$ ,  $z = 3.40$ ,  $p < .001$ ,  $r = .43$ .

See Table 2 for median scores.

[Insert Table 2 about here]

## Discussion

In support of the hypotheses, evidence was found for effects of trait thought suppression on dream content, sleep quality, and emotional states, as follows.

An effect of thought suppression on dreaming of emotional waking-life experiences was found, but the results were more nuanced than those of Malinowski (2015), in which a relationship was found between both thought suppression and thought intrusions and dreaming of emotional waking-life experiences. In the present study, individuals who experienced high levels of thought intrusions reported dreaming more of their emotional waking-life experiences than those who experienced low levels of thought intrusions; but the effect for thought suppression did not reach significance. This illustrates the importance of differentiating the effects of suppressing thoughts and experiencing unwanted thought intrusions.

Interesting effects were found regarding suppression / intrusions and the valence of the dreamt-of emotional experiences. Neither thought suppression nor intrusions had significant effects on dreaming of positive emotional experiences from waking life, but both dimensions had significant effects on dreaming of negative emotional waking-life experiences: specifically, those that contained sadness, anger, anxiety, and fear. The only negative emotion for which there was no significant difference was guilt, and this is likely due to the floor effect for this variable. These results build on previous research showing that thought suppression leads to dream rebound (Bryant et al., 2011; Taylor & Bryant, 2007; Wegner et al., 2004), and point to a specific effect for negatively valenced thoughts in dream rebound.

Individuals high in thought suppression and intrusions also had poorer sleep quality. For both analyses the effects were large, bolstering previous findings that thought suppression is implicated in insomnia (Harvey, 2001, 2003). Coupled with the dream rebound effect, these findings clearly illustrate that both sleep quality and dream content are negatively affected by the tendency to try to suppress thoughts during wakefulness.

Large effects were also found for thought suppression and intrusions on depression, anxiety, and stress scores. Research has shown that thought suppression is implicated in mental health disorders such as Generalised Anxiety Disorder (Becker et al., 1998). A dream rebound experiment similarly demonstrated that thought suppression led not only to more dreams of the suppressed thought, but also to more dream distress, and higher levels of general psychiatric symptomatology (Kröner-Borowik et al., 2013).

Identifying whether dreams picture suppressed emotions, and which suppressed emotions are pictured, is important in understanding how dreamwork can play an important role in the therapeutic process. Evidence exists for the efficacy of dream-based psychotherapy (Hill & Knox, 2010) and for the insight-generating potential of dreamwork in a non-clinical setting (Edwards, et al., 2015). It may be that these methods of generating personal insight and/or conducting therapeutic work are efficacious at least in part because they permit a window into problematic thoughts that have previously been ignored – in line with what psychoanalysts have been suggesting for decades (e.g. Freud, 1900; Jung, 1948).

Some methodological limitations must be noted. The present study investigated trait thought suppression, but conclusions about effect must be tentative since suppression was not experimentally manipulated; future research should investigate the effects of manipulated suppression on dreaming of different waking-life emotions. Additionally, alternative ways of collecting dreams besides the Most Recent Dream method should be used in future research, such as dream diaries and systematic awakenings. Objective methods of analysing dream rebound should be used also, to verify self-report measures. Additionally, it should be considered whether there are underlying variables that influence trait thought suppression. For example, it may be that high suppressors have had more adverse life experiences than those low suppressors, and so have more unpleasant thoughts.



There is much yet to be understood about the effects of thought suppression and intrusions on dream content, sleep quality, and mental health. Many different aspects of this relationship may be investigated in future. For example, research could address the possibility that dreaming of waking-life emotions may moderate the effect of thought suppression on mental health; or that mental health may moderate the effect of thought suppression on dream rebound. An emotion-processing theory of dreaming (e.g. Cartwright, 2011; Malinowski & Horton, 2015) would indicate that dreams play a role in the overnight process of integrating and assimilating our emotional experiences.

Further, it remains unclear why the dream rebound effect exists. One possibility is that it is due to the specific physiology of REM sleep (Wegner et al., 2004). If this is the case, dream rebound should be evidenced in REM-sleep dreams, but less so in non-REM sleep dreams or comparable waking cognitions such as daydreams. Future research should investigate this and other explanations for the dream rebound effect.

## **Conclusion**

The present study has illustrated that trait thought suppression, measured by the White Bear Suppression Inventory (WBSI: Schmidt et al., 2009; Wegner & Zanakos), has negative effects on dream content, sleep quality, and emotional states. High thought suppressors are more likely to dream of their negative waking-life experiences, have poorer sleep quality, and suffer higher levels of depression, anxiety, and stress, than low suppressors. These findings have wide-ranging implications for our understanding of the negative effects of ignoring unwanted thoughts, particularly in relation to how working with dream content may assist in identifying and working with suppressed thoughts, for the purpose of increasing awareness of one's own unconscious thoughts, which may have therapeutic benefit.

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