

Dreaming and personality: Wake-dream continuity, thought suppression, and the Big Five Inventory.

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Abstract

Studies have found relationships between dream content and personality traits, but there are still many traits that have been underexplored or have had questionable conclusions drawn about them. Experimental work has found a 'rebound' effect in dreams when thoughts are suppressed prior to sleep, but the effect of trait thought suppression on dream content has not yet been researched. In the present study participants (N=106) reported their Most Recent Dream, answered questions about the content of the dream, and completed questionnaires measuring trait thought suppression and the 'Big Five' personality traits. Of these, 83 were suitably recent for analyses. A significant positive correlation was found between trait thought suppression and participants' ratings of dreaming of waking-life emotions, and high suppressors reported dreaming more of their waking-life emotions than low suppressors did. The results may lend support to the compensation theory of dreams, and/or the ironic process theory of mental control.

1. Introduction

Many studies have investigated the concept of a relationship between traits and dream content. For example, researchers have investigated dream content and dominant personality types (Foulkes, 1970), field-dependence (Goodenough, 1976; Witkin, 1969), type A-B personality (Nesca & Koulack, 1991), self-regulation (Busby & De Koninck, 1980); and more. Reviews of the relationship between dreaming and personality traits have indicated mixed results (Blagrove, 2007; Blagrove & Pace-Schott, 2010; Domhoff, 1996). However, some traits have received more attention than others, and have been the subject of many studies; as such, more is known about them. For example, the personality trait 'boundariness' consistently produces relationships with aspects of dream content: individuals with thin boundaries have dreams that are more lengthy, emotional, vivid, and nightmare-like than those with thick boundaries (e.g. Hartmann, Elgin, & Garg, 1991; Hartmann & Kunzendorf, 2006-7). Similarly the construct of psychological well-being (PWB) has received a large amount of attention. This construct encompasses a range of dimensions such as the extent to which one is depressed and anxious, and it has been found that those with low PWB tend to have more recurrent dreams, more nightmares, and more unpleasant dreams than those with higher PWB (Belicki, 1992; Blagrove, Farmer & Williams, 2004; Brown & Donderi, 1986; Zadra & Donderi, 2000).

Thought suppression, which can be measured by the White Bear Suppression Inventory (Wegner & Zanakos, 1994), is a trait in which an individual tends towards trying to suppress their thoughts. There is some evidence that thought suppression during waking life may be related to a 'rebound' effect during dreaming: that is, the return of the suppressed waking thought when one is asleep and dreaming. Wegner et al. (2004) found that suppressing the thought of a person increased dream references to that person, more than freely thinking about the person or simply mentioning them once. Bryant et al. (2011) found that this rebound effect was increased by cognitive load. Similarly Kronor-Borowik et al. (2013) found that thought suppression immediately before sleep led to greater incidences of dreaming of the unwanted thought, and Taylor and Bryant (2007) found that this effect is particularly strong in individuals who are high suppressors. Another line of evidence for the rebound effect comes from Delorme et al.'s (2002) study with students undergoing examinations: students who used inappropriate coping strategies during waking life, such as positive reappraisal (reframing the problem without actually solving it), rather than problem-solving, went on to have problem-solving dreams. Taken together, the evidence suggests that thought suppression is related to dreaming of the to-be-forgotten thought. However, it remains to be discovered whether trait suppression, as measured by the WBSI, is related to dream content more generally.

Several studies have also been dedicated to investigating whether the 'Big Five' personality traits of extraversion, neuroticism, agreeableness, conscientiousness, and openness, as measured by the Big Five Inventory (John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008; John & Srivastava, 1999) are related to types of dreaming, with a particular focus on neuroticism. Two studies (Cohen & Cox, 1975; Samson & De Koninck, 1986) found evidence that neurotic individuals have more wake-dream continuity in their dreams, and dreams that are more set in the future or past than the present. Further evidence of the connection between neuroticism and wake-dream continuity comes from Aumann, Lahl, and Pietrowsky (2012), who found that neuroticism was positively related to the 'incorporation' factor (e.g. "I dream of people I met the preceding day") of their unpublished 'Düsseldorf Dream Inventory'. It was also related to dream bizarreness, but the correlation was small. Additionally, neuroticism has been shown to relate to nightmare frequency and/or distress (Schredl, 2003; Schredl, Landgraf, & Zeiler, 2003), and negative dream content (Pesant & Zadra, 2006), suggesting an emotional continuity, since neuroticism involves emotional lability (John et al., 2008). In terms of the other four traits, Aumann et al. (2012) found that extraversion related positively to wake-dream incorporation and negatively to dream bizarreness; openness related positively both to incorporation and bizarreness; conscientiousness related negatively to bizarreness; and

agreeableness to neither. However, many of these correlations were very small – for example, incorporation and extraversion had a significant correlation of just .07 – and may have reached significance due to the large number of correlations having been performed without an appropriate statistical method of correction applied, so further research is needed.

In this study the relationship between dream content and personality traits, as measured by the White Bear Suppression Inventory (Wegner & Zanakos, 1994), and the Big Five Inventory of personality traits (John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008; John & Srivastava, 1999) was investigated using the ‘Most Recent Dream’ method of collecting dream reports. It was hypothesised that trait thought suppression would relate to dreaming more of waking-life concerns and emotions, as trait suppressors may deliberately try to suppress these thoughts during wakefulness. It was further hypothesised that neuroticism would relate to wake-dream continuity in general, and to dreaming of waking-life emotions, since neuroticism is an emotionally labile trait. Other correlations were performed as exploratory analyses and no hypotheses were formulated for these.

2. Method

2.1. Participants

106 (85 female) participants completed the full online questionnaire and consented to have their data used in the analyses, with an age range of 18-56 ($M=24.03$, $SD=7.72$). 18 participants did not provide their age. The majority of participants ($N=71$) were second-year undergraduate psychology students at the University of Bedfordshire who participated in the questionnaire as part of a class on dreaming and were given the option of refusing their data to be used in the analysis. The remainder were recruited via the website Reddit on the subreddit /dreams/ ($N=27$), and via word of mouth ($N=7$). One participant did not report how they heard about the study.

2.2. Materials

Participants were asked a series of three questionnaires, all hosted in one weblink via the online questionnaire resource Qualtrics.

The first questionnaire asked them to report their most recent dream. They were instructed as follows (as adapted from the ‘Most Recent Dream’ form at http://www2.ucsc.edu/dreams/Forms/most_recent_dreams.html):

“Please write down the last dream you remember having, i.e. your most recent dream. This could be as recent as last night or from as far back as childhood, but should be the most recent one you can remember having, no matter how long or short it is. Please describe this dream exactly and as fully as you remember it. Your report should contain, whenever possible: a description of the setting of the dream, whether it was familiar to you or not; a description of the people, their age, sex, and relationship to you; any animals that appeared in the dream. If possible, describe your feelings during the dream and whether it was pleasant or unpleasant. Be sure to tell exactly what happened during the dream to you and the other characters.”

Following this, participants were asked to detail what, if anything, they thought the dream was about, or meant (results for the analysis of this question are not included in this paper), when they had the dream, how much overlap they saw between the dream and their current waking

life, their past waking life, and their waking life emotions, how similar the dream was to waking-life reality, how different it was to their waking life, how bizarre the dream was, how symbolic the dream was, how emotional the dream was, the extent to which the dream pictured their waking-life financial, work-related, or relationship worries, and the extent to which the dream was sexual, violent/aggressive, or contained friendliness. All questions except the open-ended question on meaning were answerable by means of a visual analogue scale ranging from 0 to 100.

The next part of the questionnaire contained the 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".

Finally, participants completed the 44-item Big Five Inventory (BFI: John & Srivastava, 1999). This questionnaire measures the 'Big Five' personality traits of extraversion (e.g. "is talkative"), agreeableness (e.g. "is helpful and unselfish with others"), conscientiousness (e.g. "does a thorough job"), neuroticism (e.g. "worries a lot"), and openness (e.g. "has an active imagination").

2.3. Procedure

Participants either took part during a scheduled class at the University of Bedfordshire, or in their own time via an advertisement placed on the subreddit /dreams/ at www.reddit.com. After reading the first page in which they were informed that they would be asked to recount a recent dream and answer some questions on it as well as some personality questions, participants could either indicate their consent to participate or close the webpage if they preferred not to participate. 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 three sets of questions (one set about the dream, and two sets to measure personality traits, as described in section 2.2). 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.

3. Results

3.1. Timing of dreams

The majority of the 106 dreams collected were either from the previous night (N=39) or within a week (N=32), with another 12 within the last month and 10 within the last year. Only 10 dreams were older than that, with six being over a year old but since childhood, and four from childhood. Three participants did not specify when they had their dream. Owing to the potential memory flaws that may exist with dreams older than one month old, the 20 dreams experienced more than a month ago were removed from the analysis, as were the three that were not specified for timing, reducing the sample to 83.

3.2. Dream length

The minimum number of words used to describe a dream was seven, the maximum 1081. The mean word length was 183.59 ($SD = 193.75$). Four dreams were not written down by participants in the questionnaire but were included in the analysis because full answers to the dream content questions had been submitted.

3.3. Comparisons of dream content variables

In order to gauge the nature of the types of dreams submitted, three comparisons were performed: 1) the extent to which the dreams were reported to relate to the dreamers' current waking life vs. their past waking life; 2) the extent to which the dreams were reported to relate to worries about work/studies vs. relationships vs. finances; and 3) the extent to which the dreams were reported to be violent/aggressive vs. sexual vs. friendly.

A paired samples t -test found that dreams were reported to refer more to current waking life than to past waking life, $t(69) = 7.38, p < .001, r = .47$ (Table 1).

Table 1: Descriptives for continuity with current and past waking life (max. available score = 100)

Dream content	Mean (SD)
Current waking life	60.91 (28.36)
Past waking life	30.90 (29.60)

A Friedman's ANOVA found that the effect of the type of worry dreamt of was significant, $\chi^2(2) = 30.96, p < .001$, and pairwise comparisons showed that participants reported dreaming more of work-related worries than financial worries ($p = .03, r = .22$), of relationship worries more than financial worries ($p < .001, r = .48$), and of relationship worries more than work-related worries ($p = .03, r = .28$) (Table 2).

Table 2: Descriptives for continuity with work/studies, relationships, and finance worries (max. available score = 100)

Dream content	Mean (SD)
Work/studies	35.86 (33.19)
Relationships	54.99 (32.88)
Finances	22.10 (26.80)

Finally, a Friedman's ANOVA found that the effect of the type of interpersonal interaction was non-significant, $\chi^2(2) = 5.69, p = .06$ (Table 3).

Table 3: Descriptives for violence/aggression, sex, and friendliness in the dreams (max. available score = 100)

Dream content	Mean (SD)
Violence/aggression	33.84 (34.03)
Sexual	25.88 (32.01)
Friendliness	43.29 (31.93)

3.4. Correlations between dream content variables and personality variables

Firstly, correlations were performed to test the hypotheses that trait suppression would be positively correlated with participants' ratings of dreaming of waking-life concerns and emotions, and that neuroticism would be positively correlated with ratings of wake-dream continuity in general and dreaming of waking-life emotions.

A significant positive correlation was found between WBSI score and how much participants reported their dream represented waking-life emotions, $r_s = .37, p = .001$; thus the more participants suppressed their thoughts during waking life, the more they reported dreaming of their waking-life emotions in their Most Recent Dream. There was also a positive correlation between WBSI score and how much participants reported their dream represented waking-life relationship concerns, $r = .25, p = .04$; thus the more participants suppressed their thoughts during waking life, the more they reported dreaming of their waking-life relationships in their Most Recent Dream. However, there was no correlation found between WBSI score and how much participants reported their dream represented work/studies nor financial concerns.

There were no significant correlations found between neuroticism and any of the dream content variables. Further exploration of the data revealed a significant negative correlation between participants' self report of agreeableness and violence/aggression in dreams, $r = -.34, p = .01$, and agreeableness and sex in dreams, $r = -.38, p = .01$. No other significant correlations were found for the Big Five personality traits.

Owing to the heterogeneity in the data in terms of participants' age and dream report length, partial correlations were next performed on the significant correlations to determine whether these relationships could be explained by either of those variables.

When controlling for both dream report length and participants' age, the relationship between WBSI score and waking-life emotions remained significant, $r = .32, p = .01$, but this was not the case for relationship concerns, $r = .21, p = .13$. Both agreeableness correlations also became non-significant after controlling for dream length and age. Thus, the only robust finding is the positive relationship between trait suppression and participants' reporting of dreaming of waking-life emotions.

To further investigate this finding, a comparison between those who scored highly on the WBSI ($M > 3.5$; $N = 50$) was made against those who had low scores on the WBSI ($M < 3.5$, $N = 33$) on the dream content variable of overlap with waking-life emotions. A Wilcoxon rank-sum test was performed to assess the effect of suppression on continuity with waking-life emotions. It was found that high suppressors reported dreaming more of their waking life emotions ($Mdn = 75.00$) than low suppressors ($Mdn = 49.00$), $W_s = 2,318.50, z = 2.70, p = .007, r = .30$.

Finally, because it has been argued that the WBSI measures the tendency to have intrusive thoughts as well as the tendency to try to suppress thoughts, correlations were further performed on the data with a 'Suppression' subscale and an 'Intrusion' subscale, using items that have loaded onto each of these scales respectively across several studies (Schmidt et al., 2009).

Controlling for both age and dream report length, participants' ratings of overlap with waking-life emotions correlated with both Suppression ($r = .26, p = .04$) and Intrusion ($r = .34, p = .006$).

4. Discussion

Most dreams were experienced the previous night, or within a week of participation, and these dreams tended to relate to current waking life, rather than past waking life. This is in keeping with both the day residue (Freud, 1900; Nielsen & Powell, 1992; Powell, Nielsen, Cheung, & Cervenka, 1995), and dream lag (Blagrove et al., 2011a, 2011b; Nielsen, Kuiken, Alain, Stenstrom, & Powell, 2004) effects. Analyses in the present study illustrated the predominance of waking-life interpersonal relationships being represented in dreams, and to a lesser extent but still common waking-life concerns about work or studying, but financial worries in dreams were relatively rare.

The only significant correlations found between dream content and personality traits were the relationships between thought suppression (score on the WBSI) and how much the dream related to waking-life emotions and waking-life relationships according to participants' self-ratings of these measures, with only the former result remaining significant when age and dream report length were controlled for. Further analyses found that high suppressors reported dreaming more of their waking-life emotions than low suppressors. The convergence between these results and those found in previous studies investigating thought suppression and dream content lends further credit to the idea that dreams picture that which has been suppressed during wakefulness. Experimental evidence has illustrated that deliberate attempts not to think of something prior to sleep leads to the appearance of the thought in dreaming (Bryant et al., 2011; Kronor-Borowik et al., 2013; Wegner et al., 2004). Added to this, the present study found that high suppressors had dreams more related to their waking-life emotions than low suppressors. This could be interpreted in line with Jung's (1934, 1948a, 1948b) compensation theory of dreaming, such that individuals who fail to think adequately about aspects of their waking life then go on to dream of them. According to the present study, it is waking-life emotions in particular that are prone to the compensation effect. It is also possible to explain these results with the ironic process theory (Wegner, 1994), in which it is postulated that deliberate attempts to think of thoughts other than the thought targeted for suppression are accompanied by a monitoring process searching for failures to suppress the thought, which can ironically lead to thoughts of it, especially when cognitive load is high. Wegner and Zanakos (1994) have argued that the dream state may be particularly prone to this effect. Future studies should investigate whether traits suppressors such as those in the present study tend to suppress specific thoughts, such as those that are emotional, and which emotions specifically, to further investigate these concepts.

The predominance of interpersonal themes in the dreams suggests that there may be a processing of social interactions during sleep and dreaming. Previous research has found that dreaming is a very social experience. For example, dreams are much more likely to contain talking with friends or sexual activity than they are to contain cognitively-focused activities like using a computer, or writing (Hartmann, 2000; Schredl, 2000; Schredl & Hoffman, 2003). Social interactions have also been found to be more common in dream reports than waking reports (McNamara, McLaren, Smith, Brown, & Stickgold, 2005). Similarly, interpersonal themes in dreams have been found to be much more common than other day-to-day concerns such as finances (Roussy, 2000; Roussy et al., 1996), a finding that was replicated in the present study. Thus the present results add to the body of evidence suggesting that dreams are peculiarly social experiences.

That there were no significant correlations between the Big Five personality traits and dream content could be interpreted in a number of ways. It may be simply that the method adopted in the present study was not sensitive enough to detect relationships, because the 'Most Recent Dream' method collects only one dream per participant, and it has been found that at least 20 dreams per participant are required for dream content to stabilise and become representative of the dreamer's wider dream life (Schredl, 2002). However, one robust relationship was found using the method in this study, so it is able to find some correlations. It may be that the relationships between the Big Five personality traits are too small to be detectable by this

method; indeed, when significant correlations were found by Aumann et al. (2012), they were often small and only significant without a correction for multiple testing. Thus, the question arises of whether such relationships are too small to be meaningful, or whether the method used in the present study simply is not sensitive enough to find meaningful relationships. More research on the Big Five personality traits and dream content, using other methods of dream report collection and data analysis, would be welcome to further investigate these possibilities.

It is also noted that the self-report method adopted in the present study opens the results up to possible bias from participants' self-attribution. That is, the correlation found between WBSI and participants' self-ratings of dreaming of waking-life emotions may reflect participants' belief in or ability to perceive overlaps with waking-life emotions, rather than overlaps *per se*. The two methods for judging emotions in dreams – ratings conducted by external judges versus self-report ratings by participants – have both benefits and disadvantages. On the one hand, self-reporting is open to errors in judgement whereby participants' beliefs about their dreams may not reflect their actual dream experiencing: a general belief that dreams reflect waking-life emotions, for example, may lead to participants perceiving more overlap between waking-life emotions and dream content. Research has found that participants sometimes misjudge their dreams in terms of interactions (friendly, sexual, and aggressive: Domhoff, 2003), and retrospective estimates of dreams are influenced by dream recall frequency (Beaulieu-Prévost & Zadra, 2005). But on the other hand, research has also shown that when judging the emotionality of a dream, external ratings greatly underestimate dreams compared to participants' self-ratings; in one study, for example, less than 1% of dreams were deemed to contain no emotions according to participant self-ratings, whereas this figure was 13.5% for external ratings (Schredl & Doll, 1998). Since judges can only rate emotionality in a dream if it is explicitly mentioned whereas participants are able to tell this simply from their experience of the dream, it is likely that it is the judges that underestimate emotions in dreams, rather than participants overestimating them. In the present study, participants were asked to judge their most recent dream, and old dreams (more than one month old) were excluded from the analysis, so those that were included in the analysis fit Beaulieu-Prévost and Zadra's criterion of the memory of the dream needing to be easily available in order for self-report to be a valid measure of dream content. Further, since external ratings misjudge emotionality in dreams, it was considered that, in spite of the potential disadvantages of self-report ratings, this was the most appropriate method for the study. Nevertheless, further research that utilises alternate methods of rating dreams for emotion would be welcome.

In conclusion, the present study found that thought suppression and thought intrusion are related to participants' reports of dreaming of waking-life emotions. This finding may provide support for the compensation theory of dreaming, or for the ironic process theory of mental control. Further, it was found that dreams were particularly social experiences, in that they represented waking-life relationships more than work/studies or financial concerns. Further research using different methodologies, and with other personality traits, should be carried out in future.

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