
Dream Content and Psychological Well-Being: A Longitudinal Study of the Continuity Hypothesis

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This longitudinal study tested the continuity hypothesis, which postulates that waking states and concerns are reflected in dreams. The relationship between dream content and negative waking affect was investigated both at fixed points in time and over a 6- to 10-year period. Twenty-eight participants completed measures of psychological well-being (PWB) and kept a dream log at two periods of their lives. Correlational analyses showed that the lower the participants' self-reported levels of PWB, the more their dreams tended to contain aggressive as opposed to friendly interactions, negative emotions as opposed to positive ones, and, to lesser extent, failures and misfortunes as opposed to successes and good fortunes. Similarly, PWB was significantly related to dream content over time. These findings are consistent with the continuity hypothesis. © 2005 Wiley Periodicals, Inc. *J Clin Psychol* 62: 111–121, 2006.

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The continuity hypothesis postulates that the content of everyday dreams reflects the dreamer's waking states and concerns. In other words, elements from people's dreams can be related to corresponding waking or psychological variables (Domhoff, 1996, 2003). This continuity principle is often set against Jung's idea that dreams serve a compensatory function by presenting neglected aspects of an individual's waking life or attitudes (Jung, 1974), but the vast majority of empirical findings support the continuity hypothesis (see Domhoff, 1996; 2003; Schredl, 2003, for a review).

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Studies have found that the occurrence of recurrent dreams, nightmares and unpleasant everyday dreams is related to one's psychological well-being (e.g., Blagrove, Farmer, & Williams, 2004; Brown & Donderi, 1986; Zadra & Donderi, 2000), that the dream reports of people suffering from certain psychopathologies (e.g., depression) can differ from those of normal control subjects (Kramer, 2000; Schredl & Engelhardt, 2001), and that certain personality dimensions such as extroversion (Bernstein & Roberts, 1995; Samson & De Koninck, 1986), neuroticism (Schredl, Landgraf, & Zeiler, 2003), and psychological boundaries (Hartmann, Elkin, & Garg, 1991; Schredl, Schäfer, Hofmann, & Jacob, 1999) are significantly correlated to dream content. Findings on the similarities between the developmental characteristics of dreaming and waking cognitive processes (e.g., Cavallero & Foulkes, 1993; Foulkes, 1985, 1999; Hartmann, 1998; Klinger, 1990; Singer, 1993) and on the incorporation in dreams of recent waking life experiences or stressors (for reviews, see De Koninck, 2000; Koulack, 1991; Schredl, 2003) are also consistent with the view that dream and waking thought contents are continuous.

Using a different approach, one longitudinal study (Lortie-Lussier, Côté, & Vachon, 2000) examined the continuity hypothesis by investigating intraindividual differences in dream content as a function of aging. Twenty-one women kept a dream journal for a few weeks at intervals of 10, 15, or 17 years. Two or three dream reports per participant were content analyzed using various scales (e.g., Hall & Van de Castle, 1966) at time 1 and time 2 of the study. Although no significant changes were found between dream content variables across time, the authors argued that many of the patterns observed in the content of the women's dreams were continuous with their developmental movement toward independence, mastery of more adaptive skills, and maturity. However, these arguments were largely speculative.

Several studies assessed dream content variables across age groups. Taken together, these studies indicate that when analyzed with the Hall and Van de Castle (H/V; 1966) coding system, dream content remains relatively stable throughout adulthood (e.g., Côté, Lortie-Lussier, Roy, & De Koninck, 1996; Domhoff, 1996; Hall, Domhoff, Blick, & Weesner, 1982; Lortie-Lussier et al., 2000). These data suggest the occurrence of few important changes in the overall content of people's dreams across time.

Studies have never tested the continuity hypothesis by correlating participants' psychological well-being with corresponding dream characteristics within a longitudinal design. One psychological dimension composed of a set of interrelated personality measures may be consistently related to dream content. This single dimension was called *psychological well-being* (PWB) by Brown and Donderi (1986), who found that adults who have recurrent dreams scored lower on indices of well-being and had more negative dream content than did past-recurrent dreamers and nonrecurrent dreamers. These results were replicated in a younger sample of recurrent dreamers (Zadra, O'Brien, & Donderi, 1997–1998). Using the same measures of PWB, Zadra and Donderi (2000) showed that people who experience bad dreams are low on self-reported measures of well-being, but not to the extent exhibited by those who have nightmares. Finally, Blagrove, Farmer, and Williams (2004) found that the frequency of unpleasant dreams was significantly correlated with levels of well-being. In sum, PWB appears as a promising and relevant psychometric dimension to test the continuity hypothesis.

Reviews of the field of subjective well-being (e.g., Diener, 1984; Diener, Suh, Lucas, & Smith, 1999) reveal that this concept is best understood as a multidimensional construct that includes three main components: pleasant affects, unpleasant affects, and a global, cognitive evaluation of life satisfaction. Given the nature of the measures used by dream researchers to assess PWB (e.g., neuroticism, trait anxiety, depression) the dimension considered in the present study corresponds to the unpleasant affect dimension of the

subjective well-being construct and not to the whole construct itself. As has dream content, subjective well-being has been found to remain stable over time (Diener et al., 1999).

The overall objective of the present study was to test the continuity hypothesis by investigating the relationship between people's PWB and their everyday dreams. The first goal was to determine whether significant relationships could be found between PWB and objective dream content variables in a nonclinical population at fixed points in time. Our first hypothesis was that the proportion of negative to positive dream elements (e.g., aggressive versus friendly interactions, negative versus positive affect) reported by participants in their dream log at a given time would be related to their scores on measures of PWB. The second goal was to investigate the continuity between dream content and PWB over time. Our second hypothesis was thus that changes in the content of participants' dream reports collected at two periods of their lives would be related to corresponding changes in PWB scores (e.g., participants who show decreases in PWB over time report increased negative dream content).

Method

Participants

Participants were first recruited in 1991 ($n = 98$) and 1996 ($n = 23$) by newspaper announcements for a series of studies on the relationship between dream content and personality variables. They were unaware at the time that they would be invited to participate in a follow-up study. Of the 111 adults who took part in phase 1 of this project, 52 were reached by phone between the summer of 2000 and summer of 2001 to participate in phase 2. Of the 43 participants who agreed to take part, 15 were excluded for failure to follow the research protocol instructions (e.g., not completing the dream log or the questionnaires as requested). Therefore, the total number of participants who successfully completed all phases of the research and for whom dream content and well-being data were analyzed was reduced from 43 to 28 (24 women and 4 men; 24 participants from the 1991 cohort and 4 from the 1996 cohort). The mean number of years between completion of phase 1 and 2 was 9.4 years. The mean age of the participants was 44.4 years (standard deviation [SD] = 13.0) at time 1 and 53.8 ($SD = 12.6$) at time 2. The youngest participant was 30 years old at time 2 and the oldest 90, reflecting the sample's heterogeneity in terms of age.

Procedure

At time 1, recruited participants attended an information meeting that consisted of a brief explanation concerning the nature of the research, the general conditions of participation, and the distribution of the research material. Signed consent forms were obtained from all participants. At time 2, a brief reminder of the tasks required was provided by telephone to participants and the research materials and consent forms were sent by mail.

Two identical sets of protocols were completed by participants at home at both time 1 and time 2. The first protocol consisted of a booklet containing a Sleep/Dream Questionnaire along with a battery of self-report questionnaires designed to measure the psychological well-being dimension originally used by Brown and Donderi (1986). The second protocol consisted of a dream journal in which participants were instructed to record any remembered dream upon awakening for 14 consecutive days. For each dream recalled, participants were instructed to record the feelings and clarity of recollection associated with the dream as well as the date on which the dream took place.

Measures of Psychological Well-Being

The four measures of PWB used in the present study are fully described, with reliability and validity data, in Brown and Donderi (1986) and are only summarized here. Specifically, the measures were *Neuroticism*, *Trait anxiety*, *Depression*, and *General psychopathology*. These variables were measured by the Neuroticism Scale of the Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1968), the State-Trait Anxiety Inventory scale (STAI; Spielberger, Gorsuch, & Lushene, 1970), the Beck Depression Inventory (BDI; Beck & Beamesderfer, 1974), and the General Symptom Index of the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1977), respectively.

Measures of Recalled Dream Content

Dream reports were coded by two independent judges by using the Hall and Van de Castle (H/V; 1966) system of quantitative content analysis. Both judges had previously received extensive training in the H/V coding system. The H/V instrument, which comprises 10 general nominal scales and a number of subscales, is the most frequently used and best validated dream content rating system (Domhoff, 1996, 2003; Winget & Kramer, 1979). Explicit operational coding rules are provided for each scale, allowing high inter-coder reliability. Researchers are encouraged to select a priori those categories most relevant to the research purpose. The H/V dream content categories selected for the present study are among the most frequently used scales in the quantitative study of dream reports and are identical to those used in studies of recurrent dreams and well-being (e.g., Brown & Donderi, 1986). We originally intended to express the dream content variables as three ratios of positive dream content to negative dream content: friendly and aggressive social interactions, positive and negative affect, and success + good fortune and failure + misfortune experiences. The measure of negative dream content could not serve as the denominator for these three variables because some participants reported no negative dream content in some of these variables (e.g., no failures or misfortunes). Consequently, these variables were expressed as the ratio of the positive dream content measure over the sum of both positive and negative measures (e.g., friendly interactions/friendly + aggressive interactions).

Positive and Negative Affect. Positive and negative affect was measured by using the H/V Emotions scale. Affects were combined and expressed as the ratio of positive to positive + negative dream affect.

Friendly and Aggressive Interactions. The friendly and aggressive interactions scale measures the frequency of emotionally toned social interactions. Friendly social interactions involve a deliberate, purposeful act or covert expression of support, help, kindness, or giving, and aggressive interactions are defined in terms of a deliberate, purposeful act or covert expression of aggression.

Success and Good Fortune and Failure and Misfortune Experiences. The H/V scales of Environmental Press and Achievement Outcome were combined to form the success + good fortune and failure + misfortune variable. *Good fortune* is scored when there is an acquisition of goods or something beneficial happens to a character that is completely adventitious or the result of a circumstance over which no one has control. *Misfortune* is defined as any mishap, adversity, harm, danger, or threat that happens to a character as a result of circumstances over which he or she has no control. *Achievement outcome*

measures whether a dream character succeeds or fails in the attainment of a goal. The variable of interest was the ratio of positive outcomes (success and good fortune) to positive and negative outcomes (success, good fortune, failure, and misfortune).

To obtain interrater reliability data, the two raters both scored independently 175 randomly selected dream reports collected at time 1 and 175 dream reports collected at time 2. Disagreements between judges were resolved by discussion. The remaining dream reports were scored by either one of the two judges.

Results

Psychological Well-Being

Table 1 presents the mean scores obtained on the measures of PWB at time 1, at time 2, as well as the mean score differences between time 2 and time 1. All mean group scores were within published normal population norms. The differences in scores obtained across time reveal that levels of PWB remained stable over time and paired *t* tests found no significant differences on any of the PWB measures between time 1 and time 2 ($p > .05$).

Dream Content

A total of 594 dream reports were collected at time 1 and 477 at time 2. The mean number of dreams per participant reported at time 1 was significantly greater than at time 2 ($t[27] = 2.40, p < .05$). There were no significant differences in the dreams' length in terms of number of words per report ($t[27] = 0.14, p > .05$). The results of statistical kappa tests obtained for each of the specific dream content rating scales for the 350 dream reports scored independently by both raters ranged from 0.74 to 0.96, indicating

Table 1
Psychological Well-Being Scores

	Time 1 (<i>N</i> = 28)	Time 2 (<i>N</i> = 28)	Time 2 – Time 1 (<i>N</i> = 28)
Well-being			
SCL			
<i>M</i>	58.3	58.8	0.44
<i>SD</i>	10.14	8.16	8.49
BDI			
<i>M</i>	5.9 ^a	7.0	1.1 ^a
<i>SD</i>	5.8	5.9	6.1
STAI-T			
<i>M</i>	36.3	35.3	–1.2
<i>SD</i>	9.4	10.8	10.0
EPI-N			
<i>M</i>	9.9	8.7	–1.3
<i>SD</i>	6.0	4.9	4.2

Note. SCL = Symptom Checklist 90–Revised; BDI = Beck Depression Inventory; STAI-T = State–Trait Anxiety Inventory–Trait; EPI-N = Eysenck Personality Inventory–Neuroticism; *M* = mean; *SD* = standard deviation.

^a*N* = 26 and not 28 (two missing values).

that interrater agreement ranged from very good to excellent across all of the content categories.

A calculation of the participants' mean scores on the original content scales used to form the ratio variables (e.g., success, misfortune, negative emotions) showed that they were relatively close to population norms (Domhoff, 1996). The mean scores obtained on the dream content measures at time 1 and time 2, as well as the mean score differences between time 2 and time 1, are presented in Table 2. Paired *t* tests revealed no significant differences on the three dream content variables between time 1 and time 2 ($ps > .05$).

Continuity Between Well-Being and Dream Content

Correlational analyses were performed to assess the interrelations among the dream content variables and measures of PWB at time 1, at time 2, and for the differences between time 2 and time 1. The results are presented in Table 3. All significant product-moment correlations were validated by using nonparametric Spearman rank-order correlations. No major changes in the correlations or levels of significance attributed to them were observed.

Overall, the correlations between dream content and PWB at fixed points in time were in the predicted directions at both time 1 and time 2; lower levels of PWB were associated with more negative dream content. Of the three dream content variables, the ratio of friendly to aggressive interactions was the most consistently and strongly correlated to PWB, followed by the ratio of positive to negative affect; while the measures of neuroticism and trait anxiety showed the strongest associations with dream content at both fixed times.

As shown in Table 3, analyses of the longitudinal data (time 2–time 1) revealed 7 significant correlations of a possible 12 between the changes in dream content and PWB

Table 2
Dream Content Measures

	Time 1 (<i>N</i> = 28)	Time 2 (<i>N</i> = 28)	Time 2 – Time 1 (<i>N</i> = 28)
Dream content measure			
Number of dreams/participant			
<i>M</i>	21.2	17.0	–4.2
<i>SD</i>	8.7	7.8	9.2
Number of words/dream			
<i>M</i>	119.3	117.7	–1.5
<i>SD</i>	85.2	77.4	56.0
Positive/negative affect			
<i>M</i>	0.40	0.36	–0.04
<i>SD</i>	0.21	0.21	0.30
Friendly/aggressive interactions			
<i>M</i>	0.51	0.54	0.04
<i>SD</i>	0.16	0.25	0.28
Success + GF/failure + MF			
<i>M</i>	0.05	0.10	–0.05
<i>SD</i>	0.06	0.15	0.16

Note. *M* = mean; *SD* = standard deviation; GF = good fortune; MF = misfortune.

Table 3

Correlations Between Dream Content and Well-Being Variables at Time 1, Time 2, and Over Time (T2-T1)

Time	Variable	SCL	BDI	STAI-T	EPI-N
1	Positive/negative affect	-.36*	-.26	-.29	-.47**
1	Friendly/aggressive interactions	-.50**	-.58***	-.50**	-.46**
1	Success + GF/failure + MF	-.20	-.15	-.19	-.06
2	Positive/negative affect	-.28	-.16	-.45**	-.43*
2	Friendly/aggressive interactions	-.20	-.48**	-.61***	-.58***
2	Success + GF/failure + MF	-.25	-.28	-.32*	-.25
2-1	Positive/negative affect	-.39*	-.02	-.46**	-.49**
2-1	Friendly/aggressive interactions	-.19	-.24	-.32*	-.33*
2-1	Success + GF/failure + MF	-.14	-.19	-.39*	-.32*

Note. SCL = Symptom Checklist 90-Revised; BDI = Beck Depression Inventory; STAI-T = State-Trait Anxiety Inventory-Trait; EPI-N = Eysenck Personality Inventory-Neuroticism; GF = good fortune; MF = misfortune.

* $p < .05$; ** $p < .01$; *** $p < .001$. All p values are one-tailed.

scores over time. The positive to negative affect ratio variable showed the most consistent and strongest correlations to PWB, followed by the social interactions and environmental press + achievement outcome ratios. All significant results indicated that ameliorations or deteriorations in the participants' PWB were accompanied by parallel changes in the content of their everyday dreams.

Discussion

To summarize the main findings of the present study: (1) scores on measures of PWB and dream content collected at two points in time were generally moderately to strongly correlated on both occasions, and (2) longitudinal data indicated that some of the variations over time in participants' levels of PWB were moderately to strongly correlated with corresponding changes in dream content variables. These results are discussed in turn.

Continuity Between Well-Being and Dream Content

Our first hypothesis, positing the existence of a relationship between everyday dream content and PWB, was partially supported. All three ratio variables of negative to positive dream content based on daily dream log data showed significant correlations with participants' levels of PWB. Specifically, the greater the participants' self-reported waking levels of unpleasant affect, the more their dreams tended to contain aggressive interactions as opposed to friendly interactions, negative emotions as opposed to positive ones, and, to a lesser extent, failures and misfortunes as opposed to successes and good fortune. This finding was true at both time 1 and time 2, although the only significant correlation involving the success, good fortune/failure, misfortune ratio was with trait anxiety at time 2. These results are consistent with the continuity principle, which posits that dream content reflects the dreamer's waking emotional state (Domhoff, 1996, 2003).

Our second hypothesis, that changes in the content of participants' dream reports collected at a multiyear interval would be related to corresponding changes in PWB scores, was also partially supported. Overall, although the continuity between PWB and

dream content over time appeared weaker than at fixed points in time, the results indicate that when PWB changed either positively or negatively, emotions, social interactions, and the combination of achievement outcome (i.e., success, failure) and environmental press (i.e., good fortune, misfortune) in participants' dream series tended to improve or deteriorate accordingly.

The three significant correlations (of a possible 12) involving dream content categories related to achievement outcome and environmental press are noteworthy because normative data show that with the exception of misfortunes, these content variables occur very infrequently in everyday dreams (Domhoff, 1996; Hall & Van de Castle, 1966). This was also true in our current sample of 1,071 dream reports as fewer than 5% of all reports contained a success, an instance of good fortune, or a failure. It is thus possible that a greater number of dream reports per participant might reveal more consistent and robust relationships with these particular content variables.

The Meaning of Continuity

Taken together, the data show that the relationship between objective measures of dream content and waking states is evident even in the everyday dreams of nonclinical populations. Specifically, our results indicate that both at fixed points in time and over a period of several years, the dream content measures of positive/negative affect and friendly/aggressive interactions are the most likely to show a significant relationship to PWB.

These data have several implications. First, they suggest that the types of concerns most likely to be reflected in people's dreams are predominantly interpersonal and emotional in nature. This hypothesis is consistent with Roussy and associates' (1996) finding that day-to-day living concerns (e.g., academics, finances, living arrangements, travel plans, work) were more common in presleep/waking ideation, whereas themes related to interpersonal issues occurred more frequently in dreams. Second, they imply that certain types of concerns have less continuity with dream content than those of a more interpersonal and emotional nature. In their reviews, Koulack (1991) and Schredl (2003) remark that real-life stressors are more likely to be incorporated into dreams than experimentally manipulated stressors and that what is stressful depends on each individual's personal characteristics. If they are correct, then the present dream content data suggest that what is stressful to most individuals are their relationships with other people and the emotions experienced in various situations. Finally, the data support the view highlighted by numerous clinicians (e.g., Bonime, 1962; Delaney, 1991; Hill, 1996, 2003) that it is potentially worthwhile to pay attention to emotions and interpersonal interactions in clients' dreams to establish parallels with their waking life situations and issues. Exploring dream content may thus be a useful vehicle for discussing social relationships with clients who are unwilling or unable to talk about such relationships directly. Future studies on this topic may continue to provide additional evidence that attending to clients' dreams is both accessible and clinically valuable across a wide range of psychotherapies (see Pesant & Zadra, 2004, for a review of various approaches to dream work and their incorporation in different forms of psychotherapy).

One methodological shortcoming of the present study is the number of dream reports collected per participant (a mean of 19 for both collections). Specifically, whereas Schredl (2002) has shown that it is preferable to have at least 20 dream reports per subject in order to obtain reliable dream content measures, 61% of our participants at time 1 and 68% at time 2 reported fewer than 20 dreams in their logs. Hence, access to a greater number of dream reports per participant would have allowed for a more reliable assessment

of relatively rare dream content categories such as success and failure. In addition, the sample size was relatively small and biased toward individuals who were interested in their dreams and by dream research. This bias in the participants' self-selection may have resulted in a less conservative test of the continuity hypothesis.

This study investigated the continuity principle at a relatively broad level and the results obtained helped clarify which components of dream content are more likely to be in continuity with waking concerns and affective states. However, because no information was collected on participants' precise life circumstances or stressors, specific factors affecting the incorporation rate of waking experiences into dream content could not be established. Schredl (2003) has argued that such information is necessary to specify the continuity hypothesis.

More research, including longitudinal studies, is required to further our understanding of the complex relation between dream content and waking psychological dimensions. One strong point of the present study lies in its having obtained significant relationships between dream content variables and PWB where one would least expect them: in a sample of everyday dreams from a nonclinical population. The relationship between PWB and dream content might well be more evident (i.e., continuous with the present findings but of greater magnitude) in various clinical samples (e.g., people who have depression) or as a function of pre- to posttreatment changes in various clinical conditions.

Because dream journals were completed at home by our participants, it is likely that the collected dream reports originated from nighttime late rapid eye movement (REM) periods (Foulkes, 1990). Dream reports from late REM periods have been shown to be more abstract, less self-referential, and more loosely associated with waking concerns of the previous day and to incorporate more elements from the distant past than reports from early REM periods (Cavallero, Foulkes, Hollifield, & Terry, 1990; Roussy, Raymond et al., 1998). Future studies could thus test whether the correlations between PWB and dream content variables are stronger with dream reports obtained from early versus late REM periods. Given the findings that PWB was most consistently and strongly related to dream content measures involving social interactions, future studies would benefit from including measures targeting the quality of interpersonal interactions in waking life. The dream continuity hypothesis could also be explored by using positive characteristics of the dreamer's waking life, such as heightened subjective well-being. Finally, from a methodological standpoint, the collection of longitudinal data at three or more time points from a large enough sample would permit the use of more sophisticated statistical techniques to capture nonlinear changes over time.

In summary, ours is the first longitudinal study to examine the relationship between people's level of psychological well-being and corresponding dream content characteristics. The findings obtained provide further empirical evidence for the continuity hypothesis and indicate that affect and social interactions represent two psychologically important dimensions in dream content that merit further study. Additional clinical and empirical investigations are required to delineate which specific components of dream content have continuity with which specific aspects of people's waking states or experiences, and the nature of their relationship over time.

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