Dreaming, Lucid Dreaming and Personality

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Summary. The term "lucid dream" describes a dream during which the dreamer is aware of being in a dream while the dream is ongoing. Our investigation focused on the frequency of the lucid dream experience and its relationship to mental health; behavioral control (TPF, Becker, 1989); decision behavior (EQS, Wolfram, 1982); and spatial abilities (3DW, Gittler, 1990). Data analysis of 89 subjects suggested that frequent lucid dreamers (n = 27) differ from rare (n = 33) and non-lucid dreamers (n = 29) by higher scores on the scales of mental health; free of complaints; assertiveness; autonomy, and self-confidence. With regard to behavioral control, decision behavior, and spatial abilities, no significant differences were found between the three dream groups.

Keywords: Dreaming; Lucid Dreaming; Mental Health; Spatial Abilities.

1. Introduction

The definition of lucid dreaming varies among researchers. Previous studies considered the minimal criteria for lucid dreaming to be met if the dreamer was aware of being in a dream (Gruber, Steffen & Vonderhaar, 1995). Gackenbach (1991) supplemented this definition by requiring that the dream be ongoing, because sometimes the dreamer wakes up upon realising his state, which could be defined as a pre-lucid dream. In agreement with Gackenbach (1991), the present study defined a lucid dream as: A dream during which the dreamer is aware of being in a dream while the dream is ongoing. Other characteristics of lucid dreams, such as memory of waking life, control over events, or awareness of capacity to make decisions (c.f. Holzinger, LaBerge & Levitan, 2006; Holzinger, LaBerge & Tholey, 1998) may be present as well. But in this study, these other characteristics were not used as requirements. .

In several studies, the phenomenon of lucid dreaming was considered within personality research (e.g. Patrick & Durndell, 2004; Schredl & Erlacher, 2004; Watson, 2001; Blagrove & Tucker, 1994; Gruber et al., 1995; Galvin, 1990). Many of these studies were focused on the relation between dream recall frequency and personality traits. For example, Hill (1974) states that frequent dream recallers tended to be less pondering, inclined to worry, and troubled. Dream recall frequency is also connected to a positive attitude towards dreams (Cernovsky, 1984). Hence, within personality research, it seems reasonable to consider a person's attitude towards dreams, since this dimension shows a stronger correlation with personality traits than with dream recall frequency (Schredl, Nürnberg, & Weiler, 1996). Moreover, dream recall frequency is also related to lucid dream frequency (e.g. Schredl & Erlacher, 2004; Watson, 2001). With the purpose to control the effects of the attitude towards dreams and the general dream recall frequency on the interaction between lucid dream frequency and personality traits these variables were included in the study.

LaBerge (1987) as well as Gackenbach and Bosveld (1991) see both mental and physical health as accompanying lucid dreaming. LaBerge (1987) adopted a holistic view of health which he described as a state of adaptive reaction to the challenges of life. As an affect of lucid dreaming, he reported an increase in self-confidence, quality of life, and well-being due to greater opportunities for making experiences. Thus, lucid dreaming can be seen as a partial aspect of mental health. Several authors (LaBerge, 1987; Gackenbach & Bosveld, 1991; Garfield, 1980; Green & Mc Creery, 1996) postulated that lucid dream frequency is related to aspects of mental health. The hypothesis that lucid dreaming is related to mental health and may play an essential role in therapy has been tested several times, but still lacks sufficient evidence.

Personality questionnaires based on factor analysis, such as the 16PF (Schneewind, Schröder & Catell, 1983), used in a number of studies, establish a profile of personality traits, but do not consider the concept of mental health as proposed by Becker (1982) or LaBerge (1987). Becker (1982) pointed out the problem of relating such dimensions to mental health. With regard to the 16PF, Becker's (1989) mental health scale was correlated positively with emotional stability (C) (r = .68) and with socially bold (H) (r = .62), but negatively with self-assurance (O) (r = -.61). In the studies of Schredl and Erlacher (2004), and Watson (2001), lucid dream frequency showed a very small but significant correlation to absorption and imagination, both subdimensions of openness to experience. On the other hand, correlations between lucid dreaming and neuroticism were absent. Obviously, the construct of neuroticism is not directly related

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Submitted for publication: January 2009
Accepted for publication: September 2009

to the construct of mental health. The construct of mental health is conceptualised more broadly than the neuroticism factor. In summary, it is proposed that global personality factors may play a minor role in explaining individual differences in lucid dream frequency.

According to Garfield (1980), lucid dreaming provides people with the confidence of handling challenges well, a skill which could also apply to waking life. As certain points of orientation exist during the waking state, but do not exist within dreams, it has been suggested that approaching dreams in a conscious way may increase a person's autonomy. Becker (1982) raised the question of whether or not autonomy is related to field independence. In the study by Gackenbach, Heilman, Boyt and LaBerge (1985), a correlation between the frequency of lucid dreams and field independence was found. This correlation was supported by the results of Gruber et al. (1995), but not by Blagrove and Tucker (1994). Blagrove and Tucker concluded that internal control, measured by locus of control (LOC, Rotter, 1966), was related more to lucid dreaming than to field independence. The results of Patrick and Durndell (2004) suggested a relationship between field independence and internal locus of control, both factors of which were significant for frequent lucid dreamers, but not for occasional lucid dreamers.

In the study by Gruber et al. (1995), frequent lucid dreamers (once a month to once a week or more) of both sexes were characterised by higher values in the following 16PF factors (Catell et al., 1970): socially bold (H); dominant (E); experimenting (Q1); enthusiastic (F), and warm (A). The authors suggested that frequent lucid dreamers, who performed increased control within the dream state, were also better able to manage or control cognitive, emotional and social functioning while awake (cf. Green & McCreery, 1996; Tholey, 1982; Garfield, 1980). Tholey and Utecht (1987) described the consciousness of free decision as the main qualitative characteristic in distinguishing lucid from ordinary dreams. In lucid dreaming, being conscious of one's state of dreaming as well as the ability to make a free decision enables the dreamer to act deliberately. Since the dream ego is not lost in its role, it can freely choose the way to act or react.

The experience of being able to try different kinds of behavior without real-life consequences can be used to find better strategies for the management of situations in waking life (cf. LaBerge, 1987). Playing different roles within a dream makes it possible to see the consequences of one's behavior that one might not notice in the waking state. Therefore, lucid dreaming can be seen as a source of relevant information about one's own situation in life. Yet, this raises the question of whether or not there is a difference between non-, rare, and frequent lucid dreamers regarding the certainty of decision-making.

Gackenbach and Bosveld (1991) described both improved spatial orientation and imagination as characteristics of lucid dreamers. For them, these qualities were connected with the ability to move effortlessly in a mental space . When comparing lucid, archetypical, and nightmare dreamers, Spandafora and Hunt (1990) found increased spatial-analytic skills in lucid dreamers. These authors supposed that dream lucidity, as a positive intensification of the dream experience, was correlated with this cognitive skill. However, at that time spatial ability was still considered to be associated with analytic skills, which contrasts with the current view. Gittler (1999) proved that spatial abilities are distinguished from analytic skills, which raises the question of whether or not lucid dream frequency is related to spatial ability as a one-dimensional skill.

In the literature, (e.g. Holzinger, Klösch, Saletu, in press; Holzinger, 2007; Spoermaker, 2006; Schredl & Erlacher, 2004; Zadra & Pihl, 1997; Abramovitch, 1995; Brylowski, 1987, 1990; Halliday, 1982a, 1982b, 1988; LaBerge, 1987; Tholey, 1981, 1988) the beneficial therapeutic affect or influence of lucid dreaming is seen in the way with which nightmares are dealt. Spadafora and Hunt (1990) explained this affect by using a phenomenological overlapping of nightmares, lucid dreaming, and archetypical dreams. Such overlapping of phenomena contains an increase in affective intensity, but differs from each other by the amount of dreamer reflexivity. Galvin's study (1990) shows that lucid dreamers differ from nightmare dreamers by a greater degree of self-coherence. Tholey (1981) noted that lucid dreaming is helpful for maintaining mental health, however, the effect of such a treatment on a not healthy population has not yet been clarified.

The present study investigates whether or not lucid dreaming is a relevant factor of mental health, behavioral control, decision behavior, and spatial ability.

2. Method

2.1. Participants

A total of eighty-nine subjects, 42 women and 47 men, volunteered to participate in the study. Eighty two (82) subjects were recruited through interviews conducted at different places in Vienna. Two subjects were recruited via the internet, and 5 replied to an advertisement enclosed with a letter to the Austrian Society for Parapsychology. The subjects ranged in age from 18 to 58, with the mean age being 36.25 ± 10.42 years.

2.2. Research instruments

2.2.1 Dream questionnaire

The dream questionnaire was a modified version of the questionnaire employed by Schredl et al. (1996). The 22 items used in the present study incorporated different aspects of dream recall such as regularity and vividness, etc., and different attitudes towards dreams. Attitudes toward dreams included: positive (e.g. "Some dreams give me creative ideas for my daily life" or "I like talking with others about my dreams"), neutral (e.g. "I am indifferent to my dreams"), and negative (e.g. "Dreams are a waste product of the brain"). The items were coded from 1 = not at all to 4 = perfectly.

Two questionnaire items were derived from Holzinger (1994), and referred to lucid dreaming. Subjects had to decide on one of two opposite statements and rate its applicability to the lucid dream experience using a scale of 1 to 6 (statement A is absolutely true = 6, rather true = 5, more likely than B = 4; statement B is more likely than A = 3, rather true = 2, absolutely true = 1). The two question items ("When I realise that I am dreaming I continue the dream" versus "When I realise that I am dreaming I wake up immediately" and "I was fully aware of being in a dream" versus "I was hardly aware of being in a dream") were used to separate respondents that actually belonged to the group of lucid dreamers (5 or 6) from those that had misunderstood

the definition of lucid dreaming given previously (Values < 4). If the decision was not clear (4), the subject was asked to give an example of a previous lucid dream. If the dream report contained at least one scene in which the dreamer was aware of being in a dream and the dream went on for at least another scene, the dream was classified as lucid. In this way, 42 participants were classified as lucid dreamers.

Both dream recall frequency and the frequency of lucid dreams were measured by a six-point scale (1 = never in the last two months, 2 = less than once a month, 3 = once or twice a month, 4 = several times a month, 5 = once or twice a week, and 6 = several times a week). In addition, the education and the origin of lucid dreams (spontaneous, deliberate training, or relaxation techniques) was recorded.

2.2.2 Mental Health questionnaire

Mental health was measured by the Trier Persönlichkeitsfragebogen (TPF, Becker, 1989). It is comprised of 120 statements to be rated by the subject on a four-point scale. Mental health was defined as the ability to cope with external and internal demands, i.e., the focus is on the trait aspects of mental health. First, two so-called super factors (1. behavioral control, and 2. mental health) were extracted. Mental health and behavioral control have a more comprising meaning than the well-known neuroticism and extraversion factors. The contents are integrated in a system theory of personality (Becker, 1988). The construct "mental health" was differentiated into three components: mental-somatic well-being (3. meaningfulness of life versus depression, 4. self-forgetting versus self-centered, 5. free of complaints versus nervousness in the sense of a good physical condition), self-actualization (6. assertiveness versus defensiveness, 7. autonomy) and acceptance of oneself and of others (8. self-confidence, 9. ability to love in terms of being sociable, regardful, and interested in the well being of others). The raw values of the participants were transformed into T-values (mean 50, standard deviation 10) by comparing them with normative data. The internal consistency of the scales ranged from r = .77 (ability to love) to r = .91 (mental health). The retest reliability coefficients for eleven months were also satisfying (r = .69 to r = .78, N = 164). Validation analyses were done by correlation studies, including commonly used personality inventories such as MMPI, 16PF, EPI, STAI and FPI; by confirmatory factor analyses; and by comparing clinical samples to healthy controls (Becker, 1989).

2.2.3 Decision-Q-Sort

Using the Q-Sort Method, the Decision-Q-Sort (EQS, Wolfram, 1982) scale measures three aspects of decision behaviour: 1. irresolution; 2. rationality in situation of deciding, and 3. readiness to take a risk. The Q-Sort is comprised of 54 cards with self-describing statements on them which were rated on a nine-point scale. The internal consistencies of the scales are high (r = .70 to r = -.89), the construct validity is succeeded.

2.2.4 Three-dimensional Cube Test

The short version of the Three-dimensional Cube Test (3DW, Gittler, 1990) includes 13 items. The first task is intended as a warm-up exercise. This power test measures spatial ability by meeting the requirements of Rasch (1980) which include Rasch-homogeneity of the item set; specific objectivity; local stochastic independence; and sufficient statistic. Therefore, when the internal consistency is given, the reliability amounts to r = .82 - .91 (Cronbach-alpha). One Item is comprised of six cubes which have to be compared with whether or not they might be identical to the pattern of a given cube by either one or three mental rotations. Tasks, which were solvable by two mental rotations, were eliminated from this test because they also can be finished by using analytical reasoning.

2.3. Procedure

First, the participants completed the dream questionnaire. Subsequently, the Decision-Q-Sort (EQS, Wolfram, 1982) scale and the short version of the three-dimensional Cube Test (3DW, Gittler, 1990) were applied. Finally, the participants completed the Trier Persönlichkeitsfragebogen (TPF, Becker, 1989). Each of the participants was assessed in a single session. Statistical analyses were carried out using the SPSS 6.0.1 software package for windows. The following calculations were two-tailed, with alpha = .05.

3. Results

3.1. Lucid dream frequency, Dream questionnaire

The participants were divided into three lucidity groups: 1. non-lucid dreamers (n = 29) who maintained that they had never had a lucid dream ; 2. rare lucid dreamers (n = 33) who had only one lucid dream experience or up to less than one lucid dream a month; and 3. frequent lucid dreamers (n = 27) who had one or more lucid dreams per month. There were no differences between the lucidity groups regarding gender, χ^2 = .12, df = 2, p = .94; age, F = .57, df = 2, p = .57; and education, χ^2 = .76, df = 2, p = .68.

The main results related to the correlations between the attitude towards dreams, dream recall frequency, and mental health, were published in detail by Schredl and Doll (2001). For the 22 items of the dream recall questionnaire, a factor analysis (principal components) with a varimax rotation was applied. Utilizing the factor extraction criteria of eigenvalue >1, six factors emerged. Yet, only two factors made sense in content, so a two factor solution was indicated. The first factor comprised 30.1% of the total variance, and both factors comprised 40.8% of the total variance. A standardized factor score was calculated on the basis of all items with factor loadings > 0.3 on the first factor. This value included 16 items (1-3, 5-10, 13, 14, 17, 18, 20-22) and described a positive attitude towards dreams. Two of these items were inverse (7, 8). The internal consistency of this scale amounted to r = .87. The second factor indicated a neutral attitude towards dreams, but was not used for further analysis.

There was a small but significant correlation between a positive attitude towards dreams and lucid dream frequency (r = .29, p = .01). Lucid dream frequency was also correlated with dream recall frequency (r =.39, p < .001).

There were no significant differences between the sexes concerning dream recall frequency, Mann-Whitney U-Test, U = 823.0, z = -.38, p = .17; lucid dream frequency, U = 934.5, z = -.44, p = .66; and attitude towards dreams, t(89) = -1.70, p = .09. There were no correlations between dream recall frequency (r = -.07, p = .51); lucid dream frequency (r = .02, p = .83); positive attitude towards dreams (r = .06, p = .58); and age. Education did not influence dream recall frequency (r = .06, p = .60); lucid dream frequency

Table 1. Analysis of variances, mean, and standard deviations of the 9 factors of the TPF (Becker, 1989) among non- (n = 29), rare- (n = 33), and frequent lucid dreamers (n = 27).

Variable	Non Lucid Dreamers	Rare Lucid Dreamers	Frequent Lucid Dreamers	Test	
	M ± *SD*	*M* ± *SD*	*M* ± *SD*	*F* =	*p* =
Behavioral control	41.7 ± 5.4	42.8 ± 5.4	44.3 ± 6.2	1.58	.21
Mental health	59.0 ± 6.9*	59.6 ± 6.7*	65.2 ± 7.8	6.57	<.01
Meaningfulness of life-Depression	38.9 ± 3.5	37.8 ± 4.3	39.9 ± 4.3	2.02	.14
Self-forgetting-Self-centered	18.4 ± 3.6	17.7 ± 3.6	19.0 ± 3.6	1.01	.37
Free of complaints-Nervousness	35.9 ± 2.9*	35.7 ± 4.0*	38.1 ± 2.5	4.73	.01
Assertiveness	30.7 ± 5.2*	31.3 ± 4.8*	34.1 ± 6.0	3.24	.04
Autonomy	43.8 ± 5.0*	45.1 ± 4.3	47.1 ± 4.7	3.51	.03
Self-confidence	30.3 ± 3.7*	30.6 ± 4.3*	35.0 ± 4.1	11.60	<.01
Ability to love	34.0 ± 5.3	33.2 ± 3.8**	36.0 ± 3.8	3.46	.04

Note. *The difference to frequent lucid dreamers is significant ($p < .05$) by means of the Student-Newman-Keuls Test.
** $U = 261.0$, $z = -2.75$, $p < .01$ (inhomogeneous variances) between rare and frequent lucid dreamers.

($r = .06$, $p = .55$); or positive attitude towards dreams ($r = -.08$, $p = .46$).

3.2. Personality traits

The data from the Trier Persönlichkeitsfragebogen test (TPF, Becker, 1989) used on non-lucid dreamers, rare lucid dreamers, and frequent lucid dreamers were analysed using multivariate analysis of variance, $F(1, 18) = 1.94$, $p = .02$, $f = .18$, and post-hoc Student Newman-Keuls Tests (see Table 1).

The differences between non-, rare- and frequent lucid dreamers were significant in the aspects of mental health, which were confirmed by repeated measure t-tests. Results indicated that frequent lucid dreamers displayed a stronger ability to manage external and internal demands; greater satisfaction with life; authority; and emotional endurance than non lucid dreamers, $t(56) = -3.18$, $p < .01$, or rare lucid dreamers, $t(60) = 3.00$, $p < .01$. Moreover, a constitution of physical and mental well-being, as indicated by a significantly higher level of freedom from complaints, was established within the group of frequent lucid dreamers as compared to the groups of rare lucid dreamers, $t(60) = -2.70$, $p < .01$, and non lucid dreamers, $t(56) = -3.02$, $p < .01$.

Differences between frequent lucid dreamers and rare lucid dreamers, $t(60) = -2.00$, $p = .05$, as well as non lucid dreamers, $t(56) = -2.27$, $p = .03$, were also observed on the scale of assertiveness. Further, frequent lucid dreamers scored higher on the scale of autonomy than did non lucid dreamers, $t(56) = -2.53$, $p = .01$, but not higher than rare lucid dreamers, $t(60) = -1.72$, $p = .09$. Moreover, frequent lucid dreamers differ from rare lucid dreamers, $t(60) = -3.96$, $p < .001$, and non lucid dreamers, $t(56) = -4.48$, $p < .001$, on the scale of self-confidence and ability to love (cf. Table 1).

Assertiveness and autonomy are dimensions of self-actualisation, where responsibility and creative realisation of one's own potentials, play a role. Assertiveness also includes certainty of decision, extraversion, and performance orientation. On this scale, frequent lucid dreamers differ from both rare- and non lucid dreamers by higher scores. Regarding autonomy, frequent lucid dreamers scored significantly higher than non lucid dreamers, indicating greater independence; self-responsibility, and readiness to take a risk. High scores were related to a high frequency of lucid dreaming, and greater autonomy was also observable in waking life (cf. Garfield, 1980). Also, within the scale acceptance of oneself and others, the differences were significant. On the scale of self-confidence, which includes being calm and well balanced, frequent lucid dreamers scored higher than the other two lucidity groups. With regard to ability to love, which reflects interest in the well-being of others, and the ability to empathise and to be helpful, frequent lucid dreamers scored higher than rare-lucid dreamers, but not significantly higher than non lucid dreamers.

No differences were noted between non-, rare- and frequent lucid dreamers on the scale of behavioral control, which includes long-term planning and striving for order, meaningfulness of life, and self-forgetting. Self-forgetting was negatively correlated with a positive attitude towards dreams ($r = -.31$, $p = .004$) and dream recall frequency ($r = -.24$, $p = .024$). This finding means that an increased dream recall frequency went along with a more pondering and worrying attitude towards the future.

A positive attitude towards dreams also seemed to be correlated to the ability to love ($r = .30$, $p = .005$); but the correlation is not a linear one. As shown in Table 1, rare lucid dreamers had the lowest scores on the scale. Frequent lucid dreamers had the highest scores on the scale, and non lucid dreamers scored in the middle. This finding raised the question of whether or not this correlation influenced the differences between the lucidity groups on this scale. When a partial Spearman correlation ($Z = 1.392$) was calculated regarding attitude towards dreams, the correlation between lucid dream frequency and the ability to love lacked significance.

Altogether, a positive attitude towards dreams was significantly more common in the group of frequent lucid dreamers than among non lucid dreamers (analyses of variances, Student-Newman-Keuls Test). The results are shown in

Table 2. Mean and standard deviations of the regression factor scores of the attitude towards dreams among the three dream groups.

Dream group	***M* ± *SD***
Non lucid dreamers (n = 27)	-.37 ± 1.19
Rare lucid dreamers (n = 33)	.12 ± 0.92
Frequent lucid dreamers (n = 25)	.25 ± 0.76

Note. One-way analysis of variance: $F(1, 2) = 3.2$, $p = .05$

Table 2. A positive attitude towards dreams also correlated with general dream recall frequency ($r = .64$, $p < .001$).
EQS. The hypothesis that the lucidity groups differ from each other (multivariate analysis of variance, $F(1, 6) = 1.41$, $p = .22$) regarding decision behavior was not confirmed by the EQS (Wolfram, 1982).

Eighty-five participants did a short version of the Three-dimensional Cube Test (3DW, Gittler, 1990). With regard to good spatial abilities, which had been described as a characteristic of lucid dreamers, no significant difference between the lucidity groups was established (one-way analysis of variance, $F(1, 2) = .39$, $p = .68$).

4. Discussion

Altogether, our results confirmed the relationship between lucid dreaming and trait aspects of mental health. The increased scores of frequent lucid dreamers on the mental health scales supported the view of LaBerge (1987) as well as Gackenbach and Bosveld (1991) that mental and also physical health are associated with lucid dreaming. The differences found between the lucidity groups on the scales of self-actualisation (assertiveness and autonomy) and self-confidence supported the theory of LaBerge (1987) and the results of Gruber et al. (1995). However, it seemed that statistically significant results could only be obtained in frequent lucid dreamers group (once or twice a month to once or twice a week). But, in sum, it is conceivable that lucid dreaming influences the management of mental conflicts in a positive way and - with qualified therapeutic accompaniment - may have a favourable affect on waking life. Still, it has to be said that the data were obtained from a healthy population and the affect of dream lucidity on mentally ill persons was not considered. The theory of Tholey (1981), according to which lucid dreaming is helpful for maintaining mental health, can be regarded as supported by this study. However, the sample was not representative of the general population and was mainly comprised of spontaneous lucid dreamers. How a training to induce lucid dreams might affect personality and well-being remains open. Future investigations may go into this question in greater depth.

The hypothesis that lucid dreaming interacts with control of behavior in waking life (LaBerge, 1987; Tholey & Utecht, 1987) was not supported. Obviously, behavioral control in waking life, which includes long-term planning and striving for order, includes a different aspect of control than that involved in lucid dreaming. The difference in the character of reality in dreams and in waking life may also play a role in this context. In contrast to waking life, dreams do not have continuity and are short-term occurrences, whereas the waking world offers a continuous reality of space and time where long-term planning is practicable. There were no differences between the lucidity groups regarding meaningfulness of life and self-forgetting, but the latter (self-forgetting) was negatively correlated with dream recall frequency. This result is in contrast to those obtained by Hill (1974), who claimed that frequent dream recallers tended to be less pondering.

Altogether, dream recall frequency correlated with lucid dream frequency, but showed other relationships to personality traits than lucid dream frequency. This suggests that lucid dreams are a phenomenon to be distinguished from ordinary dreams. (cf. Watson, 2001). The correlation found between a positive attitude towards dreams and general dream recall frequency agrees with the results of Schredl et al. (1996) as well as Cernovsky (1984).

With regards to good spatial abilities, no differences between the dream lucidity groups were observed. Apparently it does not matter whether visual imagery is rehearsed in waking or in dreaming consciousness. Further investigations might clarify whether or not previous results were influenced by aspects of analytical skills, which may play a role in dream lucidity.

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