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Lucid dreaming: associations with internal locus of control, need for cognition and creativity

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Abstract

A lucid dream is defined as occurring when an individual becomes aware that they are dreaming, and, while remaining asleep, can control some of the events or content of the dream. Frequent lucid dreamers have previously been shown to be more internal on Rotter's Locus of Control (LOC) scale than are non-lucid dreamers. The present study found that frequent lucid dreamers ($n = 22$) had higher scores than non-lucid dreamers ($n = 20$) on the Internal dimension of Levenson's LOC scale, but not on Levenson's LOC Powerful Others and Chance dimensions. Frequent, and also occasional lucid dreamers ($n = 15$), also scored significantly higher on Need for Cognition and on Gough's self-assessed Creative Personality scale, than did non-lucid dreamers. The results indicate a continuity between styles of waking and dreaming cognition, just as previous work has shown a continuity of content. © 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Dreaming; Personality; Locus of control; Need for cognition; Creativity

1. Introduction

Lucid dreaming is defined as occurring when an individual becomes aware that they are dreaming while remaining asleep (Fenwick, Schatzman, Worsley, Adams, Stone & Baker, 1984). They can then consciously control some of the events or content of the dream. Snyder and Gackenbach (1988, p. 230) conclude that about 58% of the population have experienced a lucid dream once in their lifetime and that 21% report them once or more per month. Purcell,

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Mullington, Moffitt, Hoffmann and Pigeau (1986) show that self-reflectiveness, measured on a nine point scale, is significantly higher in dreams during rapid eye movement (REM) sleep than in other stages of sleep, and that 2.4% of REM dreams are lucid, which is the highest rating on their scale. Kahan (1994) found that in 2.3% of dreams the dreamer was aware that they were dreaming, and such awareness was significantly associated with, although dissociable from, conscious control of dream events. This paper addresses personality characteristics of individuals who report lucid dreaming. Blagrove and Tucker (1994) found that individuals who frequently have lucid dreams (that is, one or more lucid dreams per month, in accordance with the definition of frequent in Gackenbach, Heilman, Boyt & LaBerge, 1985) were significantly more internal on Rotter's (1966) Locus of Control scale than were individuals who had never had a lucid dream, with infrequent lucid dreamers scoring mid-way between these groups. We wished to replicate this finding, but using an alternative measure of Locus of Control, that of Levenson (1981), because the single dimension of internal–external attribution on the Rotter scale is confounded by beliefs about whether the world is difficult, just, predictable, and politically responsive (Collins, 1974).

Levenson's (1981) LOC scale differentiates internality (I), the belief in one's own control over events and outcomes, from belief in powerful others (PO), and belief in chance (C). Unlike Rotter's unidimensional scale, items that determine the I, P and C dimensions are phrased to be relevant to the individual's experience, rather than their beliefs about people in general, and the dimensions have negligible correlations with social desirability. Levenson (1981) reviews findings that internality on Rotter's scale correlates positively with I, and negatively with C, with the correlation with P being smaller; whereas P and C usually correlate significantly, they each have low correlations with I. Although there are differences between locus of control and active versus reactive engagement style (McKinney, 1981) and self-control (Palenzuela, 1988), internal LOC correlates positively with real life attempts to control the environment (Lefcourt, 1992; Rotter, 1966, pp. 19–21), such as information assimilation by patients, ability to use biofeedback, entrepreneurial activity, and helping behaviour (Levenson, 1981). Our prediction was thus, as in Blagrove and Tucker (1994), that frequent lucid dreamers would be more internal, but also, using the greater differentiation afforded by the Levenson scale, that the dimensions of belief in powerful others, or chance, would not have an association with lucid dreaming, which is concerned more with self-reflectiveness and active control.

As lucid dreaming involves a greater self-focused attention and is a cognitive skill that can be increased by attentional and mnemonic techniques learned when awake (Purcell et al., 1986), we hypothesised that it would be associated with high Need for Cognition (NFC). NFC is the intrinsic motivation to engage in and enjoy effortful cognitive tasks, especially in contexts with minimal extrinsic incentives (Thompson, Chaiken & Hazlewood, 1993), and 'represents individuals' tendency to think about and elaborate on events in searching for reality' (Cacioppo & Petty, 1982). NFC correlates positively with Burger and Cooper's (1979) Desirability of Control (Thompson et al., 1993), with self-appraised effectiveness at problem solving (Heppner, Reeder & Larson, 1983), and with field independence (Cacioppo & Petty, 1982), which has been argued by Gackenbach et al. (1985) to be related to lucid dreaming frequency. Furthermore, Martin, Silva, Newman and Thayer (1994) show that the cognitively complex factor of evaluative epistemological style (which involves one's realisation of

responsibility for epistemic choices) is positively correlated with NFC, with Desirability of Control, and with Levenson's LOC-I, but not PO or C. This supports our predictions that frequent lucid dreamers would score higher on NFC and on LOC-I.

Blagrove and Tucker (1994) found frequent lucid dreamers scored 13.2%, equivalent to 0.43 SDs, higher than non-lucid dreamers on Domino's (1970) Creativity adjective check list, with occasional lucid dreamers scoring in between, but this difference was not significant, and Snyder and Gackenbach (1988, pp. 245–246) report generally no difference in creativity between lucid and non-lucid dreamers, except for some indications of greater creativity for females. However, Bernstein and Belicki (1995–96) found the frequency of lucid dreams correlates with imaginativeness as measured by the physiognomic cue test, in which subjects are assessed on their tendency to animate and anthropomorphize simple line drawings. We therefore assessed creativity in the present study, using the Gough (1979) adjective check list, which has advantages over the Domino scale in that it has some negatively weighted items, which reduces effects of acquiescent responding, and correlates better with independent criterion ratings of creativity within many different employment samples. We predicted that the greater cognitive complexity and reduced functional fixity of creative individuals (Charlton & Bakan, 1988–89) would be associated with increased likelihood of subjects recognising that they were dreaming.

2. Method

2.1. Subjects

All subjects were university students who responded to advertisements asking for lucid and non-lucid dreamers. Demographic variables were: frequent lucid dreamers (male = 13, female = 9, mean age = 21.5 (3.3) years), occasional lucid dreamers (male = 9, female = 6, mean age = 22.8 (4.2) years), and non-lucid dreamers (male = 10, female = 10, mean age = 22.8 (7.3) years). We acknowledge the possibility that some of our subjects may have undertaken training aimed at influencing their levels of self-awareness or their numbers of lucid dreams, and that this may confound the results, but none of the subjects reported attempting such training.

2.2. Materials

Each subject completed a booklet containing demographic questions, questions about their dreams, and the three personality questionnaires. Creativity was measured by Gough's (1979) adjective check list, which has 12 negative and 18 positive items, scores can range from −12 to +18. Gough (1979) reports the mean score for psychology graduate students is 6.0 (3.9) for males and 5.4 (3.9) for females, and 6.0 (3.7) for male research scientists. Items on the other two personality questionnaires were answered on 6-point Likert scales (strongly disagree to strongly agree). Need for Cognition was measured by the 18-item scale of Petty and Cacioppo (1986); NFC is negatively related to being closed minded, unrelated to social desirability, and positively related to general intelligence (Cacioppo & Petty, 1982). Scores can range from −54

to +54. The three subscales of Levenson's (1981) LOC scale each have 8 items, scores for each subscale can range from 0 to 48.

2.3. Procedure

In the test booklet subjects estimated how often they recalled dreams. They were then given the definition of lucid dreams, and they stated whether they had ever had a lucid dream, and if so, how frequently. All subjects then had to write a report of a dream: for lucid dreamers this was to be an example of a lucid dream so as to ensure that they were categorising the dream correctly, and to ensure that awareness of dreaming while remaining asleep, and some control of dream events or contents, were present; such use of both self-rating of lucid dream frequency and experimenter rating of reports is recommended by Kahan (1994). Frequent lucid dreamers were defined as having one or more lucid dreams per month, occasional lucid dreamers had at least one lucid dream in their lifetime, but less than one per month, and non-lucid dreamers had never had one. To avoid a confound with dream recall frequency, which correlates positively with self-reflectiveness in dreams (Gackenbach et al., 1985; Purcell et al., 1986) and with creativity (Fitch & Armitage, 1989), only individuals who reported recalling a dream at least once per week were included, and the three groups were compared on the number of subjects categorised as recalling dreams at least once per night, and the number categorised as recalling dreams at least once per week but less than once per night.

3. Results

Group means and SDs of scores on NFC, Creativity, and the three dimensions of LOC are shown in Table 1. The three groups were significantly different on NFC, Creativity, and LOC-I, with lucid dreamers (LDs) being higher on all three scales than non-lucid dreamers (non-

Table 1
Group mean scores on Need for Cognition, Creative Personality Scale, Locus of Control-Internal, Powerful Others, and Chance, for frequent, occasional, and non-lucid dreamers[a]

	Frequent LDs $n = 22$		Occasional LDs $n = 15$		Non-LDs $n = 20$			
	Mean	SD	Mean	SD	Mean	SD	F (2,51)	p
NFC	20.55**[c]	18.14	23.87***[c]	15.86	8.75	10.25	5.00	0.010
CPS	9.82****[c]	2.67	8.93*[c]	2.76	6.50	3.15	7.74	0.001
LOC-I	33.77**[c]	6.17	33.07	6.67	29.45	4.87	3.31	0.045
LOC-PO	16.59	5.57	16.07	5.65	18.70	6.82	1.16	n.s.[b]
LOC-C	19.55	8.02	17.20	7.52	22.45	7.58	1.72	n.s.

[a] Categorising each subject as either (a) recalling dreams at least once per night, or (b) recalling dreams at least once per week but less than once per night, the three groups had the following number of subjects in each category respectively: Frequent LDs, 19, 3; Occasional LDs, 10, 5; Non-LDs, 12, 8. This dream recall categorisation did not differ significantly between the three groups, χ^2 (2) = 3.89.

[b] Not significant.

[c] Planned one tail comparisons with non-LDs: $^{*}p < 0.025$, $^{**}p < 0.01$, $^{***}p = 0.001$, $^{****}p = 0.0005$.

LDs). For creativity there was a significant interaction of group with sex, $F(2, 51) = 5.56$, $p = 0.007$, although for each sex the LD groups scored higher on creativity than non-LDs; there were no significant interactions of group with sex on any of the other personality variables, and sex had no significant main effect on any of the variables. There was a non-significant tendency for lucid dreamers to score lower on LOC-C, that is, they have less belief than non-lucid dreamers that events in the world are due to chance. Using the planned comparisons of each LD group with the non-LD controls, and taking $p = 0.025$ as the Bonferroni adjusted level of significance, the frequent lucid dreamers scored significantly higher than non-lucid dreamers on NFC, CPS and LOC-I ($t(40) = 2.56$, 3.69 and 2.50, 1-tail $p = 0.007$, 0.0005 and 0.0085 respectively), and occasional lucid dreamers scored significantly higher than non-lucid dreamers on NFC and CPS ($t(33) = 3.42$ and 2.38, 1-tail $p = 0.001$ and 0.0115, respectively). The difference between occasional and non-lucid dreamers missed significance on LOC-I and LOC-C ($t(33) = 1.86$ and 2.03, $p = 0.036$ 1-tail and $p = 0.05$ 2-tail, respectively).

The table note shows the number of subjects in each group categorised as recalling dreams at least once per night, and those categorised as recalling dreams at least once per week but less than once per night; the groups did not differ significantly on this, $\chi^2(2) = 3.89$. By independent t-test the two categories of dream recall frequency did not differ significantly on LOC-I, $t(55) = 1.16$, creativity, $t(55) = 1.09$, or NCS, $t(55) = 0.24$.

4. Discussion

We have replicated the result of Blagrove and Tucker (1994) that individuals who report lucid dreaming are more likely to believe in internal locus of control of waking life events, and we have extended that result by showing that the relationship is specifically with internal attributions, and not beliefs about powerful others or chance. This result accords with the finding of Kahan and LaBerge (1996) that when subjects give reports of a dream and also of an autobiographical waking event, there is a significant association between ratings of the amount of internal commentary in each type of report, and also between ratings of the amount of self-reflection, with this association between the two types of report being found when the ratings are made by the subject, and when they are made by an independent judge. This result also accords with the findings of Gruber, Steffen and Vonderhaar (1995), that the 16PF composite score that best distinguishes frequent from infrequent and non-lucid dreamers is that of subduedness/independence, with high scorers on this factor exhibiting initiative, and low scorers being passive and in need of external support; these authors state that high scorers are more likely to achieve self-reflection and volitional control while dreaming because they are proficient at the management of waking cognition and emotion. We have also shown that lucid dreamers have significantly higher need for cognition and self-assessed creativity than non-lucid dreamers. Individual differences in these two aspects of cognition may be related to lucid dreaming because of the correspondence with cognitive complexity and flexibility (Charlton & Bakan, 1989–90), and because need for cognition and attributional complexity correlate with Internal State Awareness and self-reflectiveness (Reeves, Watson, Ramsey & Morris, 1995). These variables may be associated either with the mean level of self-reflectiveness when awake

and when dreaming, or with the likelihood of individuals noticing bizarre occurrences during dreams, and hence realising they are not awake (Darling, Hoffmann, Moffitt & Purcell, 1993).

It is, though, arguable whether our results are due to individual differences in actual dream content and cognitive abilities, or rather post-sleep individual differences in the attribution of awareness and control when reporting the dream. Similarly, Wood, Sebba and Domino (1989–90) argue that the robust finding of a significant positive correlation between waking creativity and dream bizarreness may be an effect of more verbally fluent individuals reporting longer dreams, which are thus more likely to include bizarre incidents, rather than due to creative individuals having different types of dream content from less creative individuals. However, individual differences in waking cognitive abilities have been shown to correlate with aspects of dream production, rather than reporting, in children (Foulkes, 1985), there is a continuity of content between waking and dream cognition (Schredl, Sahin & Schäfer, 1998), there has been physiological verification of lucid dreaming reports (Fenwick et al., 1984), and training in lucid dreaming, either due to its effect on awareness or control of dreams, has been used as a treatment for recurrent nightmares (Zadra & Pihl, 1997). The results here may thus be held to indicate a continuity of style of cognition between waking and dreaming, which accords with the findings of Purcell et al. (1986) of individual differences in self-reflectiveness during dreams, and the arguments of Kahan and LaBerge (1994, 1996) for a continuity of metacognition between waking and dreaming.

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