

## LUCID DREAMING – DREAMS OF CLARITY

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### Abstract

Although the concept of ‘lucid dreaming’ was first coined by Frederik Willems van Eeden, a Dutch psychiatrist, and introduced at the meeting of The Society for Psychical Research held on 22 April 1913, the phenomenon of lucid dreaming was already known in earlier historical periods and its descriptions can be found in writings of Aristotle. However, modern lucid dreaming research was established only after LaBerge introduced his method for physiological investigation of lucid dreaming through eye signals in 1980. Current attempts in the field are directed at defining the neuro-physiological correlates of lucid dreaming, an aim that still has yet to be achieved. One of the possible applications of lucid dreaming is in the field of psychotherapy where it is usually used in treating nightmares. However, other possible therapeutic potentials of lucid dreaming are still in the process of being discovered and therefore constitute a fertile area for future researchers. Copyright © 2009 British Society of Experimental & Clinical Hypnosis. Published by John Wiley & Sons, Ltd.

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**Key words:** cognitive restructuring techniques, lucid dreaming therapy, neuro-physiological correlates of lucid dreaming, nightmare treatment, therapeutic applications of lucid dreaming

### Historical origins

Lucid dreaming is a state of consciousness which could be called altered: it happens while we are sleeping. We owe to a few courageous oneirologists – pioneers of dream research – that today in both personal experience and scientific research we have begun to understand the potential of lucid dreaming, conscious dreaming, or dreams of clarity (Klarträume), as this fabulous state is also called.

The term lucid dreaming was coined by Frederik Willems van Eeden, a Dutch psychiatrist and writer who established a ‘free psychiatry’ movement in the Netherlands around the end of the nineteenth century. On 22 April 1913 he gave a lecture at the meeting of The Society for Psychical Research where he spoke about 352 ‘lucid dreams’ he had recorded. Van Eeden had turned to Freud in several letters and had reported several of his ‘night adventures’. Around half a century later, Paul Tholey named the condition described by van Eeden as lucid dreaming, ‘Klartraum’, or ‘dream of clarity’, and defined it as follows: ‘Dreams of clarity (Klarträume) are those dreams in which the dreamer has complete consciousness and awareness about the fact that one is dreaming and can therefore interfere or influence, even create the dream as he or she wishes’ (Tholey, 1980: 175). Lucid dreamers often report being in possession of all their cognitive faculties: they are able to reason clearly, to remember the conditions of waking life, and

to act voluntarily within the dream upon reflection or in accordance with plans decided upon before sleep (Carskadon, 1995). Lucid dreams also differ from other dreams in that the dreamer is conscious of his state and at the same time knows that he can decide and act freely: understanding and will function as well as the memory of the wakeful existence and ‘switch themselves on’. The span of possible experiences during lucid dreaming extends from perceptions and feelings to fantastic and bizarre adventures. Therefore, lucid dreams are described as peak experiences or ‘high dreams’ (Tart, 1990). In contrast to imaginative day-dream techniques such as trance, shaman journeys, hypnotic states, or the *Katathymen Bilderleben* (Leuner, 1962), lucid dreaming takes place during sleep and not during waking.

Although lucid dreaming as a phenomenon was only defined in the twentieth century, one can find examples of descriptions of this phenomenon in ancient history. In his treatise ‘On dreams’, Aristotle wrote that our consciousness during sleep often makes us recognize that whatever experienced at the moment is a dream:

[If] the sleeper perceives that he is asleep, and is conscious of the sleeping state during which the perception comes before his mind, it presents itself still, but something within him speaks to this effect. The image of Koriskos presents itself, but the real Koriskos is not present... For often, when one is asleep, there is something in consciousness which declares that what then presents itself is but a dream (Aristotle, 1952: 702ff)

Lucid dreaming was especially cultivated in Tibetan Buddhism and is known in Sufism and Indian yoga (for further information see LaBerge, 1985). In Tibetan Buddhism, it was practised as a form of yoga, called dream yoga, from the eighth century on and was used to exercise the maintenance of consciousness during all sleep stages. Namkhai Norbu also calls this state of illumination dreams of clarity. The final goal was to be able to maintain consciousness in the event of death so that one could consciously encounter the path to the other world. The dream yogis of Tibet were the first to possess an experimentally based understanding of dreams as being solely the mental creation of the dreamer (Evans-Wentz, 1935). For them, lucid dreams represented an opportunity to experiment with and realize the subjective nature of the dream state and, by extension, the waking experience as well. Dream yoga, as the Tibetans call lucid dreaming, marks in their spiritual world the possibility of overcoming Karma. Somewhere in the twelfth century, a Spaniard Sufi, Ibn-El Arabi noted: ‘a person must control his thoughts in a dream. The training of this alertness... will produce great benefits for the individual. Everyone should apply himself to the attainment of this ability of such great value’ (Shah, 1964: 141)

A hundred years later, Thomas of Aquin (1224/25–1274; 1947: 430) mentioned that lucid dreams arise towards the end of sleep and that such experiences are more frequently reported by people with a strong imagination. In addition, he stated: ‘[N]ot only does the imagination retain its freedom, but also the common sense is partly freed; so that sometimes while asleep a man may judge that what he sees is a dream, discerning as it were, between things and their images.’ Therefore, lucid dreaming must have probably been known already in the middle ages.

The first author known to us who dealt with lucid dreaming systematically is Marquis d’Hervey de Saint Denys. This professor of Chinese literature who lived in the nineteenth century described in his book *Les Rêves et les Moyens de les Diriger* (Dreams and the Means of Directing Them; 1982) his 20 years of experience in dream research. He published this book anonymously in 1867. In the fourth edition of his *The Interpretation of Dreams* (Die Traumdeutung), Sigmund Freud (1900/1960: 466) wrote:

Marquis d'Hervey claimed to have won such an influence over his dreams that he could accelerate them as he wished and give them the direction that he desired. It seems that in him the wish to sleep had accorded a place to another, a preconscious wish, the wish to observe his dreams and to derive pleasure from them. Sleep is just as compatible with such a wish-resolve as it is with some proviso as a condition of waking up (wet-nurse's sleep). We know, too, that in all persons an interest in dreams greatly increases the number of dreams remembered after waking.

Ernst Mach himself seems to have been familiar with the phenomenon of lucid dreaming, because in his *The Analysis of the Sensations* (1922: 206) one can find the following:

As I was much concerned with space questions, I dreamed of a walk in the forest. Suddenly I noticed the unsatisfactory perspective shift of the trees and recognized in that a dream. Immediately, however, I noticed some slips. In the dream I saw a beaker filled with water in my lab, in which calmly a candle light burned. 'From where is it supplied with oxygen?' I thought. 'Where do the incineration gasses go?' Now blisters from the flame started ascending in the water, and I was calmed down.

Frederik Willems van Eeden, to whom we owe the term lucid dreaming, kept a dream diary for many years and finally spoke of his nightly adventures in the novel *The Bride of Dreams*. In the year 1913, he presented 352 reports on his lucid dreams collected between 1898 and 1912 at the meeting of the Society for Psychical Research:

In these lucid dreams, the re-integration of the psychic functions is so complete that the sleeper reaches a state of perfect awareness and is able to direct his attention, and to attempt different acts of free volition. Yet the sleep, as I am able confidently to state, is undisturbed, deep and refreshing (Van Eeden, 1913: 437).

However, only when Freud (1900/1960) proclaimed dreams to be the royal road to the unconsciousness, did dreaming slowly become an area of interest for scientists. Dream research started to show greater progress, and investigating dreams became a more collaborative effort rather than just a self reflection of certain individuals.

In addition to van Eeden, Mary Arnold-Forster, Hugh Calloway (who published under the name Oliver Fox) and Ram Narayana also published on the subject of lucid dreams at the beginning of the twentieth century. Oliver Fox (1939) devoted himself to a phenomenon he called 'astral projection', a concept which refers to out of body experiences (OBEs) during sleep. For LaBerge this phenomenon is a preliminary stage in recognizing the state of lucid dreams. The OBE that can occur in waking and in sleep is a dissociative phenomenon (the body appears separated from the soul), while the state of lucid dreaming could also be described as an associative phenomenon (complementation of sleep by the capacity of consciousness by added cognition). In 1936, A.E. Brown (1936) developed a technique through which a dreamer could prove to themselves that they are dreaming: he recommended jumping in the air to test the perception of the force of gravity. This was described in the *Journal of Abnormal Psychology* under the title 'Dreams in which the dreamer knows he is asleep'. A similar article was also composed by Moers-Messmer in 1938: 'Dreaming while knowing about the dream state'. Ten years later, an article named 'The pleasant dreams' (1948: 309ff) was published by Nathan Rapport, an American psychiatrist. He wrote: 'the nature of dreams may be studied best on those rare occasions when one is aware that he is dreaming'. Finally, Havliczek (1966) wrote 'A contribution to the dynamics of "lucid" dreams'.

## Contemporary clarification and experimentation

Even if the twentieth century clearly marks the increase of interest in lucid dreaming, only during the last 30 years has it become possible to subject lucid dreaming to scientific investigation, and the researchers most meritorious for this achievement are Paul Tholey and Stephen LaBerge, two oneirologists who devoted their lives to researching lucid dreams. LaBerge made it possible with his ‘eye signals during lucid dreaming’ method to physiologically investigate lucid dreaming by comparing physiological processes with dream reports more precisely. He invented the eye-signalling-method (see below), performed the first scientific research studies about lucid dreaming at Stanford University, and made lucid dreaming and dreaming an accessible subject for research. In addition, LaBerge stated that a lucid dreamer ‘could carry out diverse dream experiments marking the exact time of particular dream events, allowing the derivation of precise psychophysiological correlations and the methodical testing of hypotheses’ (LaBerge, Nagel, Dement and Zarcone, 1981a: 727). Furthermore, he developed many techniques for entering the lucid dream state at will, of which one is the ‘mnemonic induction of lucid dreams’ (MILD) technique (LaBerge, 1980a). On the other hand, Tholey, as a Gestalt theorist, laid the epistemological basis for the research of lucid dreams.

Tholey (1980, 1981) defined seven different conditions of clarity that a dream must fulfill in order to be defined as a lucid dream (translated and adapted by the author). The author replaces the word ‘Klarheit’ (clarity) with the word ‘awareness’, which is a well known and central term in Gestalt therapy theory and describes the subjective experience of the conscious dream state quite well:

1. Awareness of the dream state (orientation);
2. Awareness of the capacity to make decisions;
3. Awareness of memory functions;
4. Awareness of identity;
5. Awareness of the dream environment;
6. Awareness of the meaning of the dream;
7. Awareness of concentration and focus (the subjective clarity of that state).

For a dream to be lucid as defined by Tholey, it must fulfill all 7 factors; for Stephen LaBerge and Holzinger lucid dreams are dreams during which the dreamer recognizes the dream state and is able to act upon volition. Factors 3–7 are descriptions of a lucid dream.

LaBerge’s ‘eye signals’ method proved to be successful in many of the subsequent studies, such as the one performed in 1980b, when he succeeded in making reports regarding lucid dream duration by comparing the time periods marked by eye movements with the later estimates of the length of these periods. Time period estimates during lucid dreaming with the help of the ‘eye signals’ method appeared to be identical to the time period estimates during waking. In another study, LaBerge and Dement (1982a) succeeded in showing that it was even possible to practise voluntary control over breathing during the state of lucid dreaming: Three subjects were instructed to either breathe fast or to hold their breath during lucid dreaming and to mark these changes in respiration with the eye movements. The instructions were, according to the statements from the subjects, successfully executed nine times. In each of these cases it was possible for a critic to estimate, through the polysomnographic recordings, which of the two tasks was correctly executed ( $p < 0.002$ ). In another one of his studies, in which four subjects took

part and which compared singing while dreaming and counting while dreaming, LaBerge discovered that the right brain hemisphere was more activated during singing and the left brain during counting. These results resemble those obtained in waking (LaBerge and Dement, 1982b).

It is of particular interest whether a 'brain state' for the lucid dream condition can be found. Measuring such a condition – with the EEG (electroencephalogram) – is still relatively crude. In addition, the EEG picture varies considerably during REM sleep. An early physiological recording of lucid dreams suggested that they begin in REM sleep (Ogilvie, Hunt, Sawicki and McGowan, 1978). Also, in studies done by LaBerge (1980c), LaBerge et al. (1981a) and LaBerge, Nagel, Taylor, Dement and Zarcone (1981b), lucid dreaming was only observed in REM sleep, which was confirmed by a number of other studies (Hearne, 1978; Ogilvie, Hunt, Kushniruk and Newman, 1983; Dane, 1984). However, considering dream research studies in general, it cannot be excluded that lucid dream states might also occur in other sleep states. The eye-signalling-method can naturally only be applied in REM-sleep (rapid eye movement sleep), as there are no eye movements in other sleep stages. Furthermore, LaBerge, Levitan and Dement (1986) compared eye movements, heart rate, blood pressure and skin potential in lucid and non-lucid dreams and showed that lucid dreams occurred in those REM period sections that were characterized by increased physiological activation. Regarding the special 'brain state' for the lucid dream condition, Ogilvie et al. (1978) and Ogilvie, Hunt, Tyson, Lucescu and Jeakins' results (1982) suggested that Alpha (8–12 Hz) was the characteristic EEG frequency during lucid dreaming.

Holzinger, LaBerge and Levitan (2006) performed a study with the goal of exploring electrophysiological differences between lucid and non-lucid dreams in REM sleep. Eleven subjects (4 women and 7 men) between 21 and 37 years old were involved in the study, all of them being experienced lucid dreamers who volunteered to participate. Polysomnographic recordings were performed on two consecutive nights, with 8 channels being used for data collection. The EEG data recorded were subjected to spectral analysis: DELTA (1–4 Hz), THETA (5–7 Hz), ALPHA (8–12 Hz), BETA 1 (13–19 Hz), BETA 2 (20–27 Hz). LaBerge's standard procedure applying light stimuli for lucid dreaming induction was used: a sleep mask was equipped with two extra-bright red-light emitting diodes (LEDs). The light stimulus consisting of 8 flashes in 2 seconds (4 Hz) was applied by pressing a button 7 minutes after each REM onset determined by polysomnography. The subjects were asked to respond to the light flashes by making different eye movement signals. The two requirements for a dream to qualify as lucid were: 1) an agreed upon LR2 eye-signal in response to light stimuli and visible in polysomnography; and 2) a subjective report of lucidity given by the subject. In order to get the best correlates between psychological data (subjects' reports) and physiological data (polysomnography), the data set was split into various 7.5 second epochs. Discriminant function analysis, MANOVA, and ANOVA revealed that the main factor discriminating lucid from non lucid dreams was the beta-1 frequency band, which significantly increased during lucid dreaming in the parietal regions of both hemispheres, which is in opposition to the results previously obtained by Ogilvie et al. (1978) and Ogilvie et al. (1982). The ratio of frontal to parietal beta-1 activity was 1 to 1.16 during non-lucid dreaming and 1 to 1.77 during lucid dreaming. The highest increase was measured in the left parietal lobe which is considered to be related to semantic capacity (Caplan, 1987; Kolb and Wishaw, 1990), although this increase was not statistically significant. From this we could conclude that awareness and understanding of the dream state that is characteristic of lucid dreaming is based on semantic interpretation of certain words or actions that appear

during the dream. However, defining the neuro-physiological correlates of lucid dreaming has just begun and we wait for further studies to provide deeper insight.

A new area of research which has the potential to further elucidate lucid dreaming is the relationship between virtual realities within video games and lucid dreaming. So far, there have only been a handful of studies on this topic: Gackenbach (2008) summarized the results of 7 such studies and found a positive relation between lucid dreaming frequency and video game play – meaning that playing video games increases the time players spend in lucid dreaming – was obtained 79% of the time. Although the author mentions several possible perspectives on the association between the two, one being that if one spends several hours a day in a technologically created alternative reality (virtual reality) one is more likely to recognize another virtual reality (lucid dreaming) when confronted by it, all the studies are correlational, which means that it is still not possible to draw any final conclusions. However, if researchers further manage to work out how to use virtual realities for the induction of lucid dreaming such a technique might be used as a part of lucid dreaming training either for creative or therapeutic purposes later described.

### **Psychotherapy and a learned skill**

Finally one of the possible applications of lucid dreaming is in the field of psychotherapy. Recurrent nightmares, for instance, have been shown to be alleviated by lucid dream induction (Zadra and Pihl, 1997), though it remains unclear whether this alleviation is because of lucidity itself or the ability to alter some aspect of the dream. Blagrove, Farmer and Williams (2001) found that lucid dreaming reduced nightmare suffering, though nightmare frequency remained unchanged.

Spoormaker and van den Bout (2006) performed a study in order to evaluate the efficacy of ‘lucid dreaming treatment’ (LTD) in chronic nightmares. Twenty-three nightmare sufferers were randomly divided into 3 groups. Eight subjects received one 2-hour individual LTD session, 8 subjects received one 2-hour group LTD session, and 7 subjects were placed on the waiting list. LTD consisted of exposure, mastery and lucidity exercises. Prior to intervention and 12 weeks thereafter subjects filled out a sleep and a posttraumatic stress disorder questionnaire. The results revealed that the nightmare frequency of both treatment groups had decreased; however, there were no significant changes in sleep quality and PTSD symptom severity. Also, lucidity was not necessary for a reduction in nightmare frequency, which indicates that the primary therapeutic component (i.e. exposure, mastery or lucidity) remains unclear.

In another study, Spoormaker, van den Bout and Meijer (2003) investigated lucid dreaming treatment for nightmares by testing 8 subjects who received a one hour individual session, which consisted of lucid dreaming exercises and discussing possible constructive solutions for nightmares. Prior to the session and 2 months thereafter, nightmare frequency and sleep quality were measured by a sleep questionnaire, and anxiety was measured by the Spielberger State and Trait Anxiety Inventory. The results revealed that the nightmare frequency had decreased and the sleep quality had slightly increased. Although lucid dreaming treatment appeared to effectively reduce nightmare frequency, the effective factors remained unclear.

Holzinger, Klösch and Saletu managed a psychotherapy study (in press) under the working name of ‘Cognition during dreaming – a therapeutic intervention in nightmares’, which included 40 subjects, men and women, 18–50 years old, whose life quality was significantly altered by nightmares. These subjects underwent Gestalt group therapy and

24 of them were also taught by Holzinger how to enter the state of lucid dreaming and use it in order to change the course of their nightmares. The nightmare prevalence in the subjects diminished from 2–3 times per week to 2–3 times per month.

Although the induction of lucid dreams is quite difficult, lucid dreaming is a learnable skill (La Berge, 1980b). There are two possibilities that could help dreamers realize that they are dreaming. The first possibility is to apply external stimuli during REM sleep (e.g., tape recordings of the phrase ‘This is a dream,’ conditioned tactile stimuli, and light). These can be incorporated in the dreams and indicate to the dreamers that they are dreaming (LaBerge et al., 1981a, b; LaBerge, 1980c). The second possibility is to teach dreamers mental techniques to recognize that they are dreaming during a dream or to voluntarily induce lucid dreams, since there are characteristics of dreaming on which one can rely as ‘dream reminders’ or ‘dream recognizing features’. Some additional techniques developed by LaBerge are, ‘wake-initiation of lucid dreams’ or WILD (LaBerge and Levitan, 1995); ‘wake back to bed’ or WBTB (LaBerge, Phillips and Levitan (1994); and as already mentioned ‘mnemonic induction of lucid dreams’ or MILD (LaBerge, 1980a). Holzinger adds relaxation techniques, hypnosis, sleep and dream education, and techniques derived from Gestalt therapy, but allows the dreamer to choose from what is introduced to them and also allows choices for how to overcome the nightmare to the liking and ability of the dreamer.

In contrast to Castaneda or Tibetan Buddhism, Holzinger is convinced that everyone can dream lucidly and that it is a natural ability that can be learned under proper guidance. Under skillful application lucid dreaming can then become a powerful method of accessing the ‘Unconscious’ and has therefore strong potential for growth, but maybe also for self destruction; therefore Holzinger pleads for knowledgeable guidance. Gackenbach (1988) has investigated the connection between lucid dreaming and bodily healing. She defines dreams as mental imagery and bases possible correlation between imagery and physiological responses relevant to healing the body on the fact that imagining oneself performing a particular action, e.g. lifting an object, causes increased activity in the body part one imagined one was using while performing the action. Therefore, becoming deeply absorbed in imagining a physiological change through the process of lucid dreaming could, according to Gackenbach, induce a physiological change, and she further tries to support the hypothesis by bringing lucid dreaming in connection with some other similar states such as hypnosis and meditation, since individuals who managed to enter a deep hypnotic state were able to reduce warts, stop smoking, lessen their allergies and lower the blood pressure through hypnotic suggestion. However, the connection between lucid dreaming and hypnosis is still not fully understood. Thus lucid dreaming is still a new and very innovative phenomenon with an open perspective as to what its therapeutic applications might be.

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