

Lucid Dreaming: A Review and Experiential Study of Waking Intrusions during Stage REM Sleep

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An infrequent event that occurs during stage REM sleep, the lucid dream is an incongruous blend of self-conscious, waking cognitions and kinematic dream imagery. The lucid dream bears a striking resemblance to waking reality, but may contain instances of altered sensory functioning, violations of physical laws, and impairment in reasoning about the relation between the dream and waking worlds. Using documented lucid dreams from past sources and a set of the author's own lucid dreams and out-of-the-body experiences, this article examines the unique attributes of the lucid dream and how the dreamer's waking consciousness functions in a nonrealistic environment. Several types of dream control are discussed, along with some possible ways of conceptualizing the nature of "waking" consciousness during a lucid dream.

Dreams accompanied by a self-conscious awareness of dreaming are termed *lucid dreams*. Such dreams juxtapose two seemingly incongruous elements: normal waking consciousness and a nocturnal dream state. As a result, lucid dreamers not only realize that they are dreaming but also experience a sense of continuity with their everyday waking lives.

Undoubtedly, the emergence of such types of awareness accounts for the extreme realism of lucid dreams, a fact that has been noted by a number of investigators (Fox, 1962; Garfield, 1974; Green, 1968a). Lucid dreams do exhibit some of the unrealistic features of normal, nocturnal dreams, but they show little evidence of bizarreness, fragmentation, or gross impairments in reasoning. Van Eeden (1913), who coined the term "lucid dream," was one of the first to describe the phenomenon in detail. His pioneering efforts included the documenting of 352 of his own lucid dreams, such as the following one:

On September 9, 1904, I dreamt that I stood at a table before a window. On the table were different objects. I was perfectly well aware that I was dreaming and I considered what sorts of experiments I could make. I began by trying to break glass, by beating it with a stone. I put a small tablet of glass on two stones and struck it with another stone. Yet it would not break. Then I took a fine claret-glass from the table and struck it with my fist, with all my might, at the same time reflecting how dangerous it would be to do this in

waking life; yet the glass remained whole. But lo! when I looked at it again after some time, it was broken.

It broke all right, but a little too late, like an actor who misses his cue. This gave me a very curious impression of being in a *fake-world*, cleverly imitated, but with small failures. (p. 448)

It is clear that the external environment depicted in the van Eeden dream is a plausible representation of waking reality. In addition, his dream thoughts during the experience demonstrate a reflective awareness and a sense of continuity with waking life. As often occurs in nonlucid nocturnal dreams, a physical law is violated, as shown by the abnormal delay in the glass breaking. Here the dreamer is fully cognizant of the incongruity—a departure from most nonlucid nocturnal dreams. However, it seems possible that, had van Eeden not consciously “tested” the dream scenario, the experience could well have continued along more normal lines without any noticeable deviation from waking physical realism.

The psychophysiological state called stage REM sleep has been found to contain a preponderance of the unrealistic features of nocturnal dreaming (e.g., vivid imagery, fluid transformations, impossible actions, performance of taboo acts). Therefore, it is interesting to find that lucid dreams, which appear to be highly rational productions, also occur during the REM stage (La Berge, 1979, 1980; La Berge, Nagel, Dement, and Zarcone, 1981)—rather than during the non-REM (NREM) sleep stages, which are characterized by more reality-oriented types of cognition.

A key issue is whether lucid dreams consist of aspects of legitimate waking awareness persisting alongside numerous stage REM phenomena or are simply “illusions” in which persons dream that they are aware of dreaming. If the former contention is true, then lucid and nonlucid stage REM dreams should be psychophysiologicaly distinguishable; if the latter contention is true, then the two should be identical. Two experiments from different sources support the claim that lucid and nonlucid dreams can be psychophysiologicaly distinguished. In one of those studies, a direct laboratory assessment of lucid dreams, La Berge (1980) pinpoints two of their distinctive features: that they are initiated from momentary wakefulness during REM periods and, during episodes of elevated REM activity. A second, earlier study conducted by Schwartz and Lefebvre (1973) indirectly supports the contention that lucid dreaming is a “mixed” psychophysiological state. Those authors investigated stage REM patterns in cases of hypersomnolence and found a positive correlation between physiological indications of wakefulness during stage REM (e.g., return of the alpha rhythm, sporadic release of muscle inhibition) and a greater likelihood that the dream was connected with the waking experimental recording environment—a situation that verges on lucid dreaming. The above two studies suggest that lucid dreams may represent, at minimum, episodic intrusions of genuine waking cognitions into stage REM periods and,

possibly, the persistence of such cognitions alongside the ongoing dream imagery.

Besides a general scarcity of information on the topic, lucid dreams merit investigation for a number of reasons. Since the person is able to maintain a detached point of reference with respect to the dream content, they permit a more objective assessment of stage REM cognitive phenomena than that achievable through nonlucid dream reporting. In some instances, the subject may be able to conduct an *in vivo* experiment while asleep on a specific aspect of dreaming, as in the van Eeden dream described earlier. Lucid dreams also allow exploration of an unusual situation: "waking" human behavior in an environment where normal physical laws may be suspended. Lastly, they offer a potent means of dream content control (Tart, 1979).

I begin the present analysis of lucid dreaming by specifying the departures of lucid dream cognition from normal waking cognition, for the following reasons: (1) to document the regions of overlap between the lucid and nonlucid stage REM dream—since the extreme realism of lucid dreaming is typically highlighted, it is also important to show the extent of nonrealism that is possible while still maintaining waking consciousness; (2) to catalogue those departures from realism and identify possible consistencies, in order to later describe the ways in which the "lucid" or waking cognitions may interact with them; (3) to identify the limits of waking realism possible during a lucid dream; i.e., at what points do confusions between the waking and dream cognitions occur?

After specifying those departures, I then compare the lucid dream with an allied phenomenon, the out-of-the-body experience (OBE). In an OBE, as in a lucid dream, persons in a nonwaking state report a continuity of experience with waking reality. Finally, I analyze a set of my own lucid dreams. I conclude by discussing the relationship of dream control to lucid dream nonrealism, and the possibility that lucid dreams may constitute an enhancement of our usual thought patterns.

How Lucid Dreams Depart from Waking Reality

Sensory Anomalies

Lucid dreams are characterized by increased visual clarity (Green, 1968a) and unusual richness of color (e.g., Moers-Messmer, 1938, pp. 291-292: ". . . the sky a bit too blue The house across the way glows with an extraordinary dazzling yellow" [author's translation]). Those factors indicate an intensification of visual imagery. In addition, there are instances of fluid transformations when objects are closely viewed. Fox (1962), Garfield (1974) and one of Green's (1968a) subjects report lucid dreams in which attempts to read are complicated by the continual changing of word shapes; Moers-

Messmer (1938) records a similar incident while dreaming about viewing a set of hieroglyphs.

Touch and proprioception show divergences from waking perceptions. A frequently reported anomaly is an absence of tactile sensations—exemplified by the ability of the lucid dreamer's body to pass through solid objects (Brown, 1936; Fox 1962; Sparrow, 1976). Such an effect also violates the laws of waking reality. Occasionally, interpenetrations are accompanied by a peculiar blend of tactile and proprioceptive sensations (Moers-Messmer, 1938). All lucid dreamers also report alterations of their usual locations in space, as shown by impossible leaps, flying, and sudden or drastic environmental changes (Green, 1968a).

Other sensory data from lucid dreams differ little from that during the waking state, and are limited to occasional reports of disembodied voices (Moers-Messmer, 1938) and loud buzzing noises (Garfield, 1975; Ouspensky, 1931; Whiteman, 1961). The senses of smell, taste, and pain are less frequently recalled upon waking than the other senses, and their functioning during lucid dreaming seems essentially the same as that during the waking state (Green, 1968a).

Conscious "Tests" of Lucid Dreaming

In vivo "tests" of the lucid dream state, such as the van Eeden test of breaking the wine glass, frequently reveal perturbations of causal and temporal laws. Brown (1936) attempted to strangle someone in his lucid dream. However, he had difficulty carrying out the "murder," as his hands kept passing through the person's body. Finally, Brown succeeded in hanging someone, but the outcome was not logical—the victim wound up alive with a sore neck rather than dead with a broken one.

Other tests by lucid dreamers have demonstrated a direct wish-fulfillment capability. Ouspensky (1931), the Russian philosopher, was able to will a black kitten to change into a large white dog. Moers-Messmer (1938) transposed noises of objects being moved into an orchestral piece. Hervey de Saint-Denys (1867/1964) reported:

Indeed, I can summon up certain scenes or produce certain images accordingly as I wish or do not wish to act mentally as a result of what I see. For example, if I want to break a branch of one of these trees which I seem to see, the branch will seem to be broken. If I do not wish this to happen the branch will continue to look unbroken to me. (p. 359)

Green (1968a) found similar capabilities in one of her subjects, who was able to create an apple in one dream and cause a bead in a molecular model to disappear in another. Such tests demonstrate a lack of realistic limitations to one's own abilities and the capability to mentally manipulate dream elements.

Coexistence of Opposites

Freud (1900/1965) noted that contradictory and opposite concepts often coexist during dreams.

Thoughts which are mutually contradictory make no attempt to do away with each other, but persist side by side. They often combine to form condensations, just as though there were no contradiction between them, or arrive at compromises such as our conscious thoughts would never tolerate but such as are often admitted in our actions. (p. 635)

Lucid dreams show similar disruptions of logic. Brown's (1936) dream of attempted murder provides one such example in which the concept *life-death* was affected. Other lucid dreamers have reported communicating with dead persons (e.g., van Eeden, 1913). Thus, lucid dreams may show a deficit similar to "normal" stage REM dreams in elaborating opposite concepts.

That explanation may shed some light on the difficulties lucid dreamers show in reasoning about the relationship between the dream and waking worlds, or the *sleep-waking* concept. For example, Myers (1887) finds nothing unusual about his family's appearance in a lucid dream, despite their absence from home in waking life. Some *sleep-waking* confusions seem to show an overly concrete interpretation of the concept. Thus, Sparrow (1976) proves to a dream character that the two of them are dreaming by "temporarily withdrawing from the dream" (p. 23).

Lucid Dreaming and OBEs

Lucid dreams have often been compared with another phenomenon, the out-of-the-body experience (OBE). In an OBE, the person feels as if awake yet located outside the physical body. Frequently the event is accompanied by autoscopy—viewing one's body from the point of view of an outside observer.

Generally, OBEs immediately follow a waking state, whereas lucid dreams begin several hours after the onset of sleep. OBEs are described as more realistic, more subject to control by the person, and less likely to contain symbolic or fantastic elements than lucid dreams (Green, 1968a). Yet, many such experiences of feeling awake while being physically asleep do not fall neatly into one of the two categories, and may contain characteristics of both. In fact, Green (1968a, p. 38) refers to a subgroup of "borderline" lucid dreams that occur immediately after sleep onset. A distinction between the phenomena is thus not so clearcut, which raises the possibility that both lucid dreams and OBEs are merely different aspects of the same phenomenon. Subjective comparisons from persons who have deliberately cultivated both

lucid dreams and OBEs suggests such a similarity (Fox, 1962; Green, 1968a; Whiteman, 1961). According to Green (1968a):

In both types of experience the percipient is observing a complete and self-consistent field of perception, and recognizes at the time that he is in a state which differs from that of normal waking life. In the majority of spontaneous out-of-the-body experiences, the subject seems to be observing his body from some point outside it but that does not constitute a qualitative distinction between the out-of-the-body experience and lucid dreams. It is possible, though less common, for a person to have a lucid dream in which he dreams that he is looking at his own body from the outside. (p. 20)

Psychophysiological studies of OBEs are scarce, the number of subjects run is few, and the findings are inconclusive. One study by Tart (1967) indicated that OBEs occur during a stage REM EEG, whereas a second (Tart, 1968) indicated that OBEs can occur during a light NREM sleep stage. It is possible to speculate that the "classical" OBE, of which a high percentage occurs during anesthesia or after a traumatic event such as a blow to the head (Green, 1968b), and is characterized by a greater degree of realism, may be a NREM sleep phenomenon—whereas the more borderline cases that resemble lucid dreams may be a REM sleep phenomenon. Such a categorization would follow from what is known about cognition during the REM and NREM sleep stages, with REM cognition being more perceptual and dramatic, and NREM cognition more conceptual and reality-oriented.

Analysis of a New Set of Lucid Dreams

I am a 31-year old male. Over a period of 34 months, I recorded my dreams on 390 days. Sixty, or about 15 percent of those dream dates contained lucid dreams or OBEs. I would like to analyze them in terms of their departures from reality that we have just considered.

In line with the accepted definition, I considered a dream lucid only when I understood that I was in a dream state, could focus attention on the dream, and could refrain, for even a small amount of subjective time, from awakening. Many of my lucid dreams were also characterized by an ability to control aspects of the ensuing dream sequence. Forty-five dreams met those criteria. I made no attempt to systematically score the depth of lucidity.

The criteria for an OBE were the same as those for a lucid dream, except that the experience had to immediately follow a waking state. That classification differs from Green's (1968a) scheme, which categorizes a number of experiences following a waking state as lucid dreams.

By always keeping a notebook and clock at bedside, I was able to record accurate estimates of both sleep onset and end-of-dream times for 29 of the nocturnal lucid dreams. (Four took place during afternoon naps and, in 12 cases, one of both sets of time data were not recorded.) For those lucid

dreams, the mean estimated sleep-onset time was 2:07 a.m. ($SD = 1$ hr, 57 min), and the mean estimated end-of-dream time was 8:29 a.m. ($SD = 2$ hr, 35 min). Thus, the approximate mean amount of time from sleep onset to the end of a lucid dream was 6 hr, 22 min ($SD = 2$ hr, 3 min). That figure agrees with the findings that lucid dreams occur during stage REM sleep (La Berge, 1979, 1980; La Berge, et al., 1981), since 6 hr 22 min after sleep onset is a time at which there is a preponderance of stage REM sleep.

Sensory Anomalies

Table 1 lists the sensory anomalies in the 60 experiences, along with pertinent observations. Visual, tactile, proprioceptive, and auditory anomal-

Table 1
Anomalies of Sensory Functioning

Sense Affected	Anomaly	Comments
Vision	Increased clarity and heightened sense.	Effect highly variable.
	Fluid transformations and disappearance of dream characters.	Faces frequently transformed; disappearances frequently accompanied by shimmering effect.
	"Flattening" of visual field to two dimensions.	Occurred during transitional "normal" dream-lucid dream or sleep-waking periods.
	Vision experienced in center of forehead.	Occurred only once during OBE.
Touch and proprioception	Interpenetration.	Frequent; often used to trigger lucidity.
	Increased skin sensitivity, tingling sensations.	Most intense experience happened during OBE.
	Flying.	Episodes of "passive" or forced flying and "active" or volitional flying.
Hearing	Difficulty in extracting meaning from conversations.	Detailed conversations interfered with maintaining sleep state.
	Spontaneous music.	Symphonic in quality; occurred during intense passive flying episodes.
Other	Pain.	Occurred during "partial" interpenetrations.
	No examples of taste or smell.	

ies were common; pain sensations sometimes occurred under unusual circumstances; taste and smell were simply not recalled.

With respect to vision, images were sporadically intensified, and clarity ranged between both extremes. In some instances, especially when I viewed outdoor scenery, images were sharp and richly textured.

Scene where I exit from my car, and the dream begins to fade. I see a street composed of red hexagonal bricks; then I view a giant field of cut grass. Somehow, I realize that I am in Pennsylvania. The longer I gaze at the red hexagonal brick road, the clearer the dream becomes. Then I start to float over a beautiful field. I feel great—the scenery is marvelous and the sky is brilliant and cloudless. [LD - 9/23/80]¹

It is interesting how I was able to keep the dream from fading and sharpen clarity by focusing on the repetitive hexagonal pattern. However, a number of the lucid dreams and OBEs had dimly lit or cloudy views. In those cases, the dream scenario was usually at my home. Therefore, it seems that both type of visual pattern and location may influence the level of dream clarity.

On the other hand, fluid transformations occurred regularly. Those transformations included not only changes in written words but also human faces.

On my way down hall, a fellow I just spoke with grabs me and insists that I return with him to his apartment. As I stand there looking at him, I suddenly blurt out "You're a psychologist that's here to help me." He smiles a bit, and then his features begin changing. Within moments, he becomes older and emaciated, as if he were aging fifty years before my eyes. That experience frightens me somewhat. Then, the process reverses itself, and the man becomes younger again. [LD - 6/24/80]

Later, I walk up to a former client of mine and "challenge" his dream identity, saying "Who are you really?" His face begins to change so that it looks like D., a female friend of mine—except a grotesque version. The face contains no nose or mouth, just some bumps covered by skin, and is changing in slow motion. I ask this strange-looking person if he is now D.; he says no, but that it is a good guess. Next, I ask if he is G., a pastor friend of mine. The person answers in the affirmative, despite only a passing resemblance to G. I then walk away for a moment and, when I return, the person looks exactly like G. [LD - 12/31/80]

A related visual anomaly was the actual disappearance of dream characters. Typically, such disappearances occurred with a principal dream character rather than a minor one. The disappearances were often accompanied by a shimmering effect, in which the space near the departed showed a noticeable vibration.

I meet a young Oriental male, in his late teens or early twenties, in my kitchen Although I ask his name and place of origin, I have trouble understanding the words as his English keeps changing back and forth from his own language. After finally obtaining his name, I write it down in my dream book (during the dream) and the fellow spells it

¹[LD] = lucid dream, [OBE] = out-of-the-body experience; dates are included.

out for me letter by letter as "Mucutq." We sit on chairs and have a brief conversation. He smiles and then disappears by "shimmering" away. For a moment after his disappearance, there is a visual distortion similar to what one sees when looking through heated vapor. [LD - 9/4/79]

The remaining two visual anomalies seem unrelated to either sensory intensification or fluid transformation, and they occurred less frequently. In one, I viewed the dream landscape as if it were flattened or two-dimensional. The effect was not simply a deficit in depth perception but a complete flattening of the visual field. Every instance occurred at either the onset or end of a lucid dream and lasted a short time (about 2 to 5 sec), which suggests that the effect was related to transitions from the "normal" stage REM to the lucid dream state, and from the lucid dream to the waking state. The second effect was a sensation that vision was not taking place through my eyes but through a spot in the center of my forehead. However, that effect occurred only once, during an OBE, and at least two attempts to reproduce it were unsuccessful.

Touch and proprioception also showed some marked changes. The phantom effect, or bodily interpenetration of objects, was both frequent and pronounced. In fact, the effect was so striking that I was often able to attain lucidity by focusing attention on the incongruity. Ease of interpenetration varied across the dream experiences. Some were effortless, as if the objects being passed through were gaseous; in others the parts of my body encountered resistance as if passing through a dense liquid; in a third group, it was both difficult and painful to accomplish an interpenetration.

I take a can opener and rip it along my shoulders and arms (i.e., pass it through my flesh with no harmful effects), thus showing the group that my body was composed of a different substance. [LD - 3/19/81]

I keep popping out of my body, and am about medium-heavy density. At first, I believe I cannot pass through walls, but I can when I concentrate; it is just slower than usual. [OBE - 12/13/80]

I am flying through a small park with apartment buildings on either side of it. I fly up to a ledge on the roof of one of them . . . and then back to the park. I also demonstrate to people how to pass my body through solid objects by willing myself to do it. As I perform that action, I try solidifying my body while interpenetrating a set of monkey bars, and feel a little pain. [LD - 7/16/80]

Certain other dreams revealed intensified skin sensations.

Somewhere in the dream, while still "awake," I feel tingly all over my body when I go to speak with my mother. My body feels very different, like it has a sparkle to it. [LD - 3/18/79]

Flying, commonly found in lucid dreams and OBEs, occurred in about 38 percent of the lucid dreams and 33 percent of the OBEs. There were two types

of flying episodes: "passive" or nonvolitional flying, and "active" or volitional flying. In the former group, I felt myself being pulled by a force; in the latter group, I consciously willed myself to fly.

While falling asleep, I begin to feel buzzing sensations throughout my body. At that point, I roll out of bed. There are many noises about me—buzzes, poppings, weird sounds, but this time I am unafraid of them and they fade away fast. I then will myself to travel; first, to my office. A fantastic ticklish feeling emanates through my body, especially in my legs, as I travel. For a while I am suspended in space; then, I softly descend to wherever it is I want to go Second, I travel to New York to visit my parents. During those travels, I am conscious of soothing, symphonic music that I have never heard before and seems to protect me. When leaving one place to travel to another, I am "whisked" away—a sensation of being pulled or yanked. [OBE - 9/6/79]

As indicated, passive flying corresponds to long-distance travel. In all passive flying dreams I experienced unusually strong ticklish sensations radiating from inside my body.

Besides its volitional character and tendency to occur in short-distance situations, my active flying was associated with physiognomic perceptions—excessive empathy with the environment (e.g., feeling the "anger" of an ocean tide). In the present dream sample, when flying was easy the dream scenario felt light, cheerful, and optimistic; when flying was difficult or impossible the environment felt dense, oppressive, and troublesome.

The dream reports contain several auditory anomalies. A frequent one was that I had difficulty following and understanding conversations. Although I heard individual sounds, it was often impossible to comprehend everything that was being said. A less frequent auditory anomaly occurred during the two passive flying experiences shown previously, where soothing, symphonic music accompanied the sensations of long-distance travel. Since I have no experience creating such music, its spontaneous occurrence was surprising. Other auditory effects seemed specific to the OBEs. The loud static poppings and noises I heard are well documented elsewhere (e.g., Garfield, 1975; Monroe, 1971; Ophiel, 1961). Since those sounds are frequently reported at the beginning of OBEs, they may constitute sleep-waking transition or hypnagogic phenomena. The same could also be true of the instances of voice broadcasting found in the present sample, which also occurred during OBEs.

Conscious "Tests" of Lucid Dreaming

Testing the physical laws of the lucid dream and OBE states produced instances of magical manipulation of the dream environment, e.g., the mental movement, transformation, and creation of dream elements.

I purposely knock over all the food on the dinner table so that I can replace it by creating matter. J. wants some gravy; I have a hard time creating some, but am able to form a

bottle of wine easily. The wine just pops in from out of nowhere with two other people. I think about the gravy, but never actually view the process of it materializing. [LD - 12/26/80]

I notice that the objects I am levitating—the bottles and small household objects—are shaking and coarsely vibrating at a distance of about 8 to 12 ft. Then, they are pulled toward me and begin to levitate at eye level and a distance of 1 ft. At that point, they cease to vibrate and are easier to control. [LD - 3/12/81]

My subjective state while conducting mental manipulations in the second of the above two lucid dreams was as follows. First, I had to maintain a level of concentration so intense that I felt sweaty and fatigued. Paradoxically, I experienced sensations of physical relaxation along with the intense mental effort. Second, I noticed sensations of my body feeling connected to the object being manipulated. When the object(s) moved, I experienced pressure sensations in my chest and abdomen—that is, if the mental manipulation was a successful one.

Coexistence of Opposites

Distortions of the *sleep-waking* concept produced the following unusual situations:

I am in an open-air stadium that is partially filled. I ask a small crowd of people if someone would “wake up” for me so that I could see what it looks like when a person is dreaming and sees a dream character awaken. A few persons volunteer—they stand up and walk quickly down the aisle of stadium steps with a drop in awareness. In other words, they suddenly appear inattentive to outside stimulation. They march around the front of the stadium and disappear. However, their disappearance is not sudden; on the contrary, it is as if they simply drop out of sight when not in my direct line of vision, or hide. I look for them, and where they should be, there are only some rocks. [LD - 6/25/80]

In this sequence, I am partially lucid, and trying to find my way home. I have my pen and jacket with me, and notice a number of adolescent kids playing in the street. I feel afraid of them, and they begin to chase me. I jump into a dead-end alley . . . put away my jacket and pen, and run to a window . . . The strange thing is that when I leave my jacket and pen behind, I think I can get them back later because I hid them in the “other dimension”—the one close to the waking state. [LD - 6/27/80]

One of the things I think to show J. is how to make my hands disappear. The thought in the dream is that I want to make a *part* of my body awaken. [LD - 12/26/80]

Each of the three dreams is characterized by my inability to comprehend that the dream scenario will cease to exist—at least consciously—upon awakening. It is as if the conceptual boundaries that are normally used to distinguish between sleep and waking are blurred. Thus, from the “dream” side, it appeared reasonable, even while “lucid,” to physically move in and out of the waking world, or produce a physical effect. A further example is shown in the earlier dream of the Oriental man who disappeared [LD - 9/4/79]: I wrote his

name in my dream diary so that it would be there when I awoke.

There was also some evidence that my *life-death* concept was altered. For example, in one lucid dream I encountered a cousin of mine who had died a year earlier. Interestingly, I accepted his presence as a matter of course, since I was sure that my cousin was in a life-after-death state. The more realistic explanation, that the dream person's identity was a result of my imagination, failed to occur during that dream. A second example was similar to Brown's (1936) dream of attempted murder, and showed a suspension of normal feelings toward death.

There is a cop in my kitchen. He is young and becomes very nervous whenever I try to touch his gun or badge. I feel as if I am in a play and explain to the cop that the two of us are here together to learn about death . . . I make my point by grabbing a B.B. gun and pointing it at him as if going to shoot. That action immediately causes him to draw his service revolver. Finally, I take my finger off the trigger and convince him that I mean no harm and am only playing. I thus manage to fool the cop into believing that I will not shoot him. He becomes friendlier and more relaxed, and, when his guard is down, I suddenly grab the gun from his holster and fire five shots into his chest and head. The thought in my mind is that I must kill him to understand death. He bleeds all over my desk as he falls down. An unusual quality about the dream is that it is lucid, but like a small play being acted out—an execution game without any feeling of guilt or remorse. [LD - 6/28/81]

Lucid Dreaming and OBEs

Overall, my OBEs resemble Green's (1968a) "borderline" group of lucid dreams; they do not bear as close a resemblance to Green's (1968b) sample of OBEs characterized by sightings of one's own body and extreme realism. In fact, only once did I clearly view my body from outside of it. Although similar, my lucid dreams and OBEs showed some consistent differences. Figure 1 lists those differences and compares the percentages of unrealistic experiences for both groups.

Flying and interpenetration were equally frequent in lucid dreams and OBEs, although instances of flying occurred in a higher percentage of lucid dreams and OBEs than instances of interpenetration. Unusual body sensations, such as tingling, as well as mental manipulation, also occurred in both but mostly in lucid dreams. Impairment of auditory comprehension and coexistence of opposites happened only during lucid dreaming. Loud noises and voice broadcasting—which may be hypnagogic phenomena—occurred only during OBEs. Thus, although my OBEs may not be representative, they show fewer instances of nonrealism than the lucid dreams, which is consistent with observations by others.

Perhaps the most noteworthy of the differences was that instances of auditory comprehension impairment and coexistence of opposites occurred in 13 to 20 percent, respectively, of the lucid dreams, but in 0 percent of the

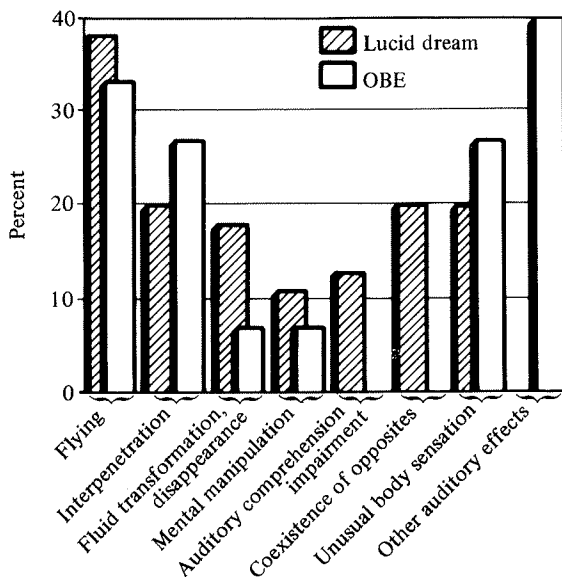


Figure 1: Percent occurrence of unrealistic experiences in author's lucid dreams ($n = 45$) and OBEs ($n = 15$).

OBEs. Based on those figures, one could speculate that the capability to abstract was adversely affected in the lucid dreams but not in the OBEs—which accords with observations by Green (1968a). We must recall, however, that the OBE sample was one-third the size of the lucid dream sample and, additionally, that the OBE episodes were of a shorter duration than the lucid dreams. Although the possibility of an abstract impairment in lucid dreams and not in OBEs exists, the amount of time sampled may have been insufficient to detect instances of abstract impairment in the OBEs.

It is sometimes difficult to determine whether an experience is a lucid dream or an OBE. The criterion for an OBE used here—that the event immediately follow a waking state—was not always clearly defined. In a few instances, awakenings during the night were followed by the event. I am inclined to agree with past authors, however, that lucid dreams and OBEs have many more similarities than differences. One other difference is worth noting. The OBE scenario usually began near my bed, whereas in lucid dreams, the dream scenario began at no particular location.

Discussion

In this paper, I conceptualize the lucid dream as a mixed psychophysiological state consisting of both stage REM and waking phenomena. If one accepts that hypothesis, then the lucid dream could be envisioned as a kind of

“nonpathological arousal disorder,” so as to distinguish it from other mixed waking/stage REM phenomena that are clearly injurious, such as the sleep attack of the narcoleptic. Thus, in contrast to narcolepsy, in which aspects of stage REM sleep (e.g., alpha motoneuron inhibition, vivid imagery) intrude upon a waking state (Hishikawa et al., 1968), lucid dreaming may represent a kind of reverse process, whereby waking cognitions, which become available during brief awakenings in an ongoing stage REM episode, persist alongside the dream imagery.

Clearly, the subjective reports of the present study contain some of the same types of plastic kinematic imagery found in normal, nonlucid stage REM dreams—although the quantity and degree of nonrealism are diminished. Specifically, the types of “nonlucid” cognition found in this sample of lucid dreams include altered sensory functioning (vision, touch, proprioception, hearing), fluid transformations, miraculous appearances and disappearances, magical thinking, and impossible actions.

I will now examine some instances of how the lucid or waking thoughts interact with the nonlucid dream imagery mentioned above. I proceed by grouping the events into the following three categories: (1) mentally manipulating dream elements so as to produce a specific outcome; (2) focusing attention on the “unreality” of a dream element; and (3) incorrectly construing a dream element as consistent with waking reality.

The first two categories include techniques that have been used by practitioners of yoga to develop dream control. For the yogin, such techniques are employed toward the goal of comprehending the illusory nature of both the dream *and* waking realities. According to Evans-Wentz (1958),

. . . the yogin learns by actual experience . . . that the character of any dream can be changed or transformed by willing that it shall be. A step further and he learns that form, in the dream-state, and all the multitudinous content of dreams, are merely playthings of the mind, and therefore as unstable as mirages. A further step leads him to the knowledge that the essential nature of form and of all things perceived by the senses in the waking state are equally as unreal as their reflexes in the dream state (pp. 221-222)

The yogic techniques include transmuting dream elements into their opposites (e.g., fire into water, large elements into minute ones, many things into one thing), and meditating on the illusory nature of a particular image, such as the dreamer’s body. The third category is an elaboration of those areas where the lucid dreamer fails to recognize an incongruity, and centers on instances of incorrect reasoning about the relationship between the dream and waking worlds (see Green, 1968a, pp. 91-97).

Let us first examine the sample discussed here for instances of mental manipulation of dream elements. Of the three types of mental manipulation I attempted—movement, transformation, or creation—movement of a dream element was the easiest to carry out and creation the most difficult. In one

lucid dream I attempted to suspend some glasses in midair. After much concentration, they arose from the ground, shaking and vibrating noticeably, and began moving toward my head, against my will. In another lucid dream, I wished to manufacture a cup of gravy. Instead, a bottle of wine materialized, along with two new persons.

The feelings and sensations I experienced while performing mental manipulations lead me to believe that the generating of kinesthetic imagery is essential to producing a successful outcome. Ideally, such imagery should consist of sensations that the dream element is physically connected to one's dream body—as if, for example, it were the termination of an imaginary limb. By contrast, verbal commands alone seem ineffective in producing mental manipulations. In any case, this direct form of dream control, which involves generating novel behaviors to produce outcomes that are at odds with waking realism, seems to require not only extreme concentration, but substantial practice.

My experiences in the second category, of focusing attention on the unreality of a particular dream element, usually resulted in the transformation of a plausible situation into a highly unrealistic one. Shortly thereafter, the lucid dream usually ended. For example, one of my “conscious tests” of the dream environment was to confront dream persons with the accusation that they were concealing their true identity. Immediately after I made such accusations, the dream persons in question would either change their identity or disappear. When I focused on the unreality of my body or some solid object, I discovered that with some effort I could move through solid obstacles unimpeded or pierce my body without ill effect. In another dream, I focused on the unreality of the dream scenario in order to *induce* lucidity—the result was that the dream landscape disappeared and I immediately began flying. Thus, it appears that this category of experience produces a sudden and drastic release from the constraints of realism but, also, one that may disrupt the lucid dreamer's equilibrium enough to cause an awakening.

The third category consists of examples of incorrect acceptance of nonrealism. According to Green (1968a), such deviations may be caused by “. . . psychological resistance to reasoning correctly about the relationship between the dream world and the world of waking life, where specific concrete details are concerned” (p. 91). My sample of lucid dreams provides support for that contention, insofar as many of my incorrect acceptances of nonrealism while lucid dreaming involved faulty reasoning about the relationship between the two worlds. However, some instances did not concern specific *concrete* details or memories of my waking life being forgotten so much as a changed *abstract* understanding of the *sleep-waking* concept. For example, on p. 91, I detail three lucid dreams in which I entertain a belief that persons or objects can move in and out of the dream scenario. In one case, I ask a group of dream persons, who I believe to be sleepers like myself, to wake

themselves up so that I can see what happens to their dream bodies. In the other two cases, I remove specific dream elements by placing them "across the border" into the waking state for later retrieval. Thus, the confusion between the concepts of sleep and waking shown by lucid dreamers may be more pervasive than previously thought, involving more than simply a loss of specific memories. The fact that a second dyad, *life-death*, seemed to also be affected in my dream sample, as demonstrated earlier, suggests that a deficit in elaborating opposite concepts may be a causative factor in producing these situations.

In a broader sense, any study of lucid dreaming is bound to impact on philosophical issues concerning the sleep-waking dichotomy. We have shown that the lucid dream scenario departs from waking realism in several respects, but let us further examine the mind that perceives those departures; that is, to what extent is the mind awake or "lucid" during a lucid dream?

Perhaps a parallel situation can be found in the problem that faces an awake person when recalling a dream. Although such a person may remember the dream's general turn of events, as well as specific persons, places, and emotions, many details of the dream and interconnections between dream sequences remain inaccessible to waking analysis. Lucid dreaming may represent an analogous situation, in which the dreamer must actively recreate or "imagine" a copy of waking reality. In both cases, persons must access memories that exist outside of their ongoing experience and, in both cases, it also appears that errors and approximations are made as details are lost. It seems likely that some mistakes may be rooted in fundamental differences in the encoding of information between the stage REM and waking states, e.g., the emphasis on kinematic imagery in stage REM versus the emphasis on verbal information in the waking state. Full comprehension of highly abstract concepts, such as the *sleep-waking* and *life-death* pairs, may be incompatible with the presence of any stage REM activity. In addition, our usual sequencing of waking memories in a linear, temporal fashion may suffer "degradation" in a state where synthetic imagery is biologically geared to predominate over analytical thought. Such an explanation could account for some of the difficulties lucid dreamers experience in placing recent concrete details of their lives, as noted by Green (1968a). Thus, even at high levels of lucidity, a "point-by-point" transfer of all waking cognitions may not be possible because of the inherent processing limitations of the stage REM state.

Finally, the possibility exists that lucid dreams constitute an enhancement of our usual thought patterns. In our own (Western) culture, we normally relegate dream events to an extremely minor role—aspects of one's fantasy life that, if recalled, are frequently viewed with detachment, amusement, and disbelief. In a lucid dream, persons holding those beliefs are suddenly confronted with a situation where aspects of those same types of critical, self-conscious awareness are intimately connected with the dream scenario. Per-

haps the confusion shown by lucid dreamers in distinguishing between the waking and dream states reflects a similar "confusion" in the waking concept of the two states as completely discontinuous—a view that would seem to facilitate the excluding from awareness of the types of irrational cognition found in stage REM dreams. A study by Domino (1976) demonstrates that a person's accessibility to those latter types of cognition may constitute an aspect of heightened creativity. In a group of students, he found that production of higher levels of irrational, "primary process" forms of cognition (e.g., symbolism, condensations, and unusual combinations), as measured in dream reports, was associated with higher teacher ratings of creativity. Possibly, the lucid dream embodies a similar phenomenon, stimulating waking control of "regressive" stage REM cognitions, and helping generate behavior patterns that are shaped by high levels of dream novelty and incongruity.

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