

# Lucid Dreams: Modifying Dream Content



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## Abstract

*Scientists have been recently investigating lucid dreams and their side effects because of their potential as therapeutic tools, where it is being claimed that they have positive impacts on immediate waking mood. This paper discusses several techniques of lucid dream induction, like WBTB, MILD, and reality testing. It also goes over several concepts related to lucidity, such as the REM stage, and different methods of dream content modification, such as altering the dream environment through mimicking a real-world scene. It turned out that lucidity does have promising results when being used as a therapeutic tool, except that it might increase negative psychopathologies on frequent use. It was also obvious that there is a partial dissociation between lucid dreams and the memories of the person experiencing them.*

## I. Introduction

Lucidity is a state of consciousness during sleep that enables dreamers to modify their dream content. However, it has got its limitations according to various internal and external factors. For instance, it depends on the place at which the participant sleeps and to what extent he is accustomed to it. It also depends on how much light is being leaked and the noise the participant is experiencing. Though they limit the ability of lucid dreaming, external factors can be altered according to needs, but when it comes to internal ones, it becomes a bit hindering. Recent studies show that controlling dream content was hard for PTSD patients to achieve, even when lucid [1]. Sleep generally consists of two phases: non-REM and REM sleep, and it is widely agreed that lucidity only occurs in the latter stage [1]. For further needs of study and research, several lucidity-inducing methods were developed. These involve MILD, WBTB, and reality testing techniques [1]. They have been used in a multi-case study to prove whether lucid dreams are associated with a positive waking mood or not. A dreamer's ability to mimic a real-world scene was also in question, so similar methods were used and experimented with to check the existence of an association between lucid dreams and partial memory [2].

## II. REM Stage

Though the study of lucid dreams has many inconsistencies and disagreements, it is unanimously agreed that lucid dreams occur within the Rapid Eye Movement stage of sleep [1]. The Rapid Eye Movement phase, also known as the REM stage, occurs after being in sleep for 90 minutes [3]. It is the last stage of sleep, and it's associated with the eye being rapidly moving right and left with other phenomena such as increased heart rate, increased blood pressure, and faster breathing [3]. Muscles also become temporarily paralyzed to prevent the dreamer from acting out of his dream [3]. Mixed frequency brain wave activity becomes very similar to those seen while awake as well. It has also been hypothesized that the recognition of being in a dream occurs in the dorsolateral prefrontal cortex, which is one of the few areas that have no activity during REM sleep and is associated with working memory [4]. However, when it happens that this part of the brain becomes activated, one recognizes he is dreaming, enabling him to act as he likes. Electroencephalography is a method of monitoring the electrical activity of the brain. It has been proved that lucidity occurs within REM through this method, where it proposes that there is increased beta

1 frequency band brain wave activity during this phase (13-19hz) [6]. This indicates an increased amount of activity in the parietal lobes, which makes the brain conscious.

### III. Inducing Lucidity

Most of the lucid dreams studies were just theoretical, with no actual evidence for their authenticity. So, several lucidity-inducing techniques were developed for the sake of experimentations. One of the methods, known as reality testing, involves genuinely checking whether you are in a dream or not throughout the day by searching for any glitches or inaccuracies in the surrounding environment. Having patients do this technique will increase the likelihood that they do it when in a dream, and therefore realize they are dreaming. Two other methods, Mnemonic Induction of Lucid Dreams (MILD) and Wake Back to Bed (WBTB), are used simultaneously. They involve waking a patient up after a certain period of time to increase his mental alertness (WBTB) and having him rehearse a phrase repeatedly, such as “I’ll remember I’m dreaming” while falling back into sleep. However, recent studies showed that lucidity induction techniques may be associated with sleep disruption [1].

### IV. Effect of lucidity on waking mood

A recent multi-case study proved that there is a link between lucidity and positive waking mood, which means it can be used as a therapeutic tool. [1]. These experiments were done in a within-subjects comparison instead of a between-subject. Because the between-subject method could be explained by individual differences, that may be certain participants were naturally more positive and of a higher ability to achieve lucidity. However, using within-subject comparisons gave the advantage of fading such a problem, indicating that lucidity itself is related to a more positive waking mood, and it actually makes sense. Because, through lucid dreams, you can face something that was previously regarded as beyond your capabilities or meet someone you miss and so. In contrast, other researchers claimed that frequent lucidity induction

may cause negative psychopathologies in the long term. For instance, a symptom known as dissociation, where one distances himself from surrounding people in order to fade emotional pain, is shown to increase with increased lucidity [1]. It’s also worth mentioning that these experiments only measured the immediate waking mood. So, determining whether lucid dreams have lasting effects on mood or not remains an important area for future research.

### V. Accessing Episodic Memories

An experimental study of dreamers’ capability of accessing episodic memories turned out to be partially true. This will be elaborated later on. The methodology used in this case study involved exposing participants to a certain experimental scene, where specific objects were put in a certain order, and participants were asked to memorize and learn them all by heart in order for them to try and mimic it in their dream environment. Figure #1 illustrates the process of interest.

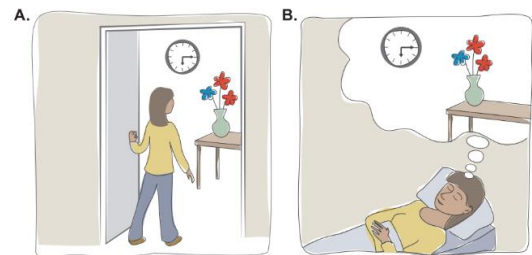


Figure #1: Mimicking a real world scene

Table 1 illustrates the list of objects used with a brief description for each of them:

There is more to the story, the procedures followed by participants to get to the point of altering dream scenery differed greatly. For instance, some participants changed their dream environment only by wishing it so. Others needed to get through a door or a portal to do so. A portal might be a glass surface, a mirror for example. These techniques are still being studied up to this moment and remain an important field of study for future research. Unfortunately,

**Table 1**  
Experimental items placed in scene/room.

Item	Brief description
Snake	Rubber rattlesnake in a coiled striking position
Fruit	Plastic fruit setup (pear, banana, etc.)
Picture of family	Mother, father, and son sitting around a chess board
Picture of individual	Headshot of female with striped (orange/blue) earrings and blue eyes
Artwork	Abstract digital painting made of many shapes
Clock	Round analog clock with Roman numerals set to 6:15
Flowers	Six individual fake roses of different colors
Blocks	Set of small toy blocks and shapes (one letter M), all red, blue, yellow, or green

**Table #1:** Objects used at the experimental scene

many inconsistencies appeared in dream scene reinstatements, indicating a dissociation between the dream environment and the scenery formed during waking [2]. However, dreamers were aware of these inconsistencies while dreaming, and they actually tried altering them. Table (2) contains several dream reports for more details.

## VI. Conclusion

Lucid dreams are being studied on a wide range because of their positive impact on waking mood, which means they could be used as a therapeutic tool. WBTB, MILD, and reality testing have proved their potential as lucidity induction techniques and are currently being used on larger scales than before. It was also proved that there are some inconsistencies in dream scene reinstatements.

## VII. References

- [1] - A. Stocks, M. Carr, R. Mallett, K. Konkoly, A. Hicks, M. Crawford, M. Schredl, and C. Bradshaw, "Dream lucidity is associated with positive waking mood."
- [2] - R. Mallett, "Partial memory reinstatement while (lucid) dreaming to change the dream environment."
- [3] - "Brain Basics: Understanding Sleep," National Institute of Neurological Disorders and Stroke. [Online]. Available: <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Understanding-Sleep>.
- [4] - A. Muzur, E. F. Pace-Schott, and J. A. Hobson, "The prefrontal cortex in sleep."
- [5] - S. LaBerge, "Lucid Dreaming: Physiological Correlates of Consciousness during REM Sleep," *The Journal of Mind and Behavior*, pp. 251–258.
- [6] - S. LaBerge, "Lucid Dreaming: Physiological Correlates of Consciousness during REM Sleep," *The Journal of Mind and Behavior*, pp. 251–258.

Participant	Dream report
sub-005	<i>... I used the car to fly to the university crashing into a window. I made my way into the correct area after navigating a maze of hallways. I entered the [experimental] room to find it mostly empty. I recalled the items I was looking for and noted missing elements, shelves, digital painting, desk gone, no end table. There is a picture where the blonde one should be. It's blurry and watery ...</i>
sub-007	<i>... I was wandering the halls of the building where the study took place ... this time they were full of ... shadowy figures ... I made it my mission to get to the room, but the closer I got the more crowded the hallways got ... but I reached my hand to the door ... the door was locked again ... so I imagined just passing through the door ... I opened the door and the room was empty ... I closed the door and tried to make things appear as they were in the room ... I would close my eyes, think of an object that I could remember and open my eyes and it would appear. First it was the wooden desk with the fruit ... I kept closing my eyes and trying to make it perfect, but then things got out of control. The clock above the switch spun to midnight ... the snake moved off the metal desk to the fruit and wrapped around them ...</i>
sub-009	<i>... I caught myself in hypnagogia and set the intent to go to the [experimental] room. I then saw myself going up the northeast flight of stairs at [the university] ... turned left past the coffee mugs ... Went ahead into the [experimental] room. I saw the picture of the girl with green turquoise eyes and rainbow earrings, then moved forward to the desk. Looked down and around, walls were clean and table next to desk was not there. Also the big painting was not there, it was a plain white wall. I saw the rattlesnake, it was mostly orange and black. The first time I saw the tail it had three black bands but when I looked again there were five, then seven and finally thirteen ...</i>

Table #2: Dream Reports