LUCID DREAMING: A WAKE-INITIATED-LUCID-DREAM (WILD) APPROACH

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by

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Approval of the Thesis

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This thesis by Elliott Gish has been

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Abstract

LUCID DREAMING: A WAKE-INITIATED-LUCID-DREAM (WILD) APPROACH

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An easy and reliable method of inducing dream lucidity remains elusive. A WILD (Wake-Initiated-Lucid-Dream) is more dependable than its alternative, DILD (Dream-Initiated-Lucid-Dream), because there is no loss of conscious awareness during the transition into dreaming. For this reason, the WILD was targeted as the main mode of induction for this case study of two weeks with the sole participant being the primary researcher. Six known techniques were mixed in an attempt to create synergistic results of lucid dreaming, three of which received high marks in a recent systematic review (Stumbrys et al., 2012). Dream lucidity was monitored using the LuCiD scale survey, dream journal entries, and verification of the phenomenon by an independent judge. Statistical analyses were used to calculate findings. Results show the feasibility and applicability of such a combination of techniques at inducing lucid dreams.

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**Introduction**

**Definitions**

Lucid dreaming is dreaming with the additional awareness that a dream is occurring while it is happening (LaBerge, 1980a). This dream awareness is typically accompanied by opportunities to influence the content; however, volitional control is not a requirement for lucid dreaming. Over the years, there have been several discussions about the definition of lucid dreaming with some arguing that a simple awareness of dreaming is not sufficient for lucidity (Tart, 1984). Others point out the fact that dream lucidity falls along a continuum, thus making it hard to say when it begins, when it ends, and to what degree it has manifested (Barrett, 1992; Moss, 1986). For the purposes of this project, the minimal definition of awareness of dreaming will be used as it is the accepted standard used by most researchers in the field at this point in time.

Dream-Initiated-Lucid-Dream (DILD) is how the majority of lucid dreams are induced. For a DILD to occur, one must first begin dreaming in a non-lucid manner and then lucidity is gained later upon recognition of the dream state. This realization can happen for a number of reasons but the important part is that the dreamer falls asleep unaware of the dreaming state and, after some enlightening event, attains dream lucidity. The Wake-Initiated-Lucid-Dream (WILD) is different in the respect that there is no loss of conscious awareness at any point in time. Throughout the entire transitional process from waking to dreaming, the dreamer remains aware of what is happening and knows that a dream is taking place from the very beginning. Most individuals find WILDs more of a challenge to achieve, but due to the retention of one’s mental faculties, they are much more dependable in nature than DILDs (LaBerge & Rheingold, 1990).

**The Problem**

Lucid dreaming is a phenomenon with several different applications (Schädlich & Erlacher, 2012). Its many potential benefits reach into the areas of consciousness studies (Hobson, 2009), cognitive studies (Kahan & LaBerge, 1994), skill acquisition (Erlacher & Schredl, 2010), creative problem-solving (Stumbrys & Daniels, 2010), physical health recovery (Kellogg III, 1999), and nightmare treatment (Spoormaker & van den Bout, 2006). Despite the promising prospects, research into these matters remains at a slow pace due to the difficulty of inducing dream lucidity easily on a reliable basis.

Dream lucidity is relatively rare amongst those who do not try to actively seek it with less than 20% of the population experiencing it once a month or more (Erlacher, Stumbrys, & Schredl, 2011; Erlacher, Schredl, Watanabe, Yamana, & Gantzert, 2008; Fingerlin, 2013; Mota-Rolim et al., 2013). When lucid dreaming arises spontaneously, it is usually happens for one of three reasons: bizarre elements within the *dreamscape,* fear stemming from nightmares, or simply knowing it is a dream (Gackenbach, 2010).

It is nearly impossible to study a phenomenon that only occurs randomly for a few minutes each month to a select number of people under a handful of conditions. And, that is why numerous techniques have been invented in attempts to boost dream lucidity through a variety of means. Unfortunately, an induction technique has still not been found that is both easily applicable and able to produce reliable results (Stumbrys, Erlacher, Schädlich, & Schredl, 2012). This is a serious problem for the scientific field of lucid dreaming because it is hindering further investigation into the phenomenon’s potentialities, especially for studies needing large sample sizes.

**The Proposed Solution**

Reliability of induction could be increased if the focus switched from encouraging DILDs to targeting WILDs. As said before, WILDs are more dependable because dreamers do not need to lose conscious awareness to attain dream lucidity like they do with DILDs. According to a study done by LaBerge, Nagel, Dement, and Zarcone, more than 80% of lucid dreams are DILDs (1981). For the lucid dream researcher, this is not great news because this means that almost all of one’s time is spent on hoping for a random occurrence of the phenomenon under examination. One possible explanation for this high amount of DILDs is that most of the induction techniques devised to date are aimed at manifesting a DILD and not a WILD (Stumbrys et al., 2012).

Another possible explanation is the level of difficulty involved in generating a WILD. Generally, a WILD takes a great deal of mental effort to induce so the chances of one happening randomly are minimal. It does happen randomly on occasion, although it is usually in advanced practitioners of the ability (LaBerge & Degarcia, 2000). So this gain in reliability with WILDs comes with a cost in applicability since many people find them harder to achieve. If someone were to discover a WILD induction technique that is easily applicable to most of the population, then the field of lucid dreaming would surely open up dramatically.

No longer is there a debate on whether lucid dreaming is a skill that can be learned (LaBerge, 1980b). Now, the discussion has shifted into what techniques are best for training this ability, but everyone is different, and lucid dreaming is no exception to this rule, as pointed out by Synder and Gackenbach (1988). For example, DeGarcia, “has 114 recorded lucid dreams of which 43% were WILDs and 56% were DILDs. In contrast, only 8% of LaBerge’s and Degarcia’s (2000) dissertation sample of 388 recorded lucid dreams were WILDs, a significantly lower proportion” (p. 283). These numbers illustrate the profound impact that different styles and induction techniques can have on one’s lucid dreaming, solidifying the notion that WILDs can be learned just like DILDs.

That is the reason behind this proposed intervention: to test a WILD induction idea on a small scale and determine whether or not it is worthy of further exploration. In the past, studies using multiple induction techniques produced a combined effect on dream lucidity that was greater than the sum of their separate effects (Levitan, 1991; Levitan & LaBerge, 1994). This project expands on that principle by mixing together more techniques than any other study has done previously. The expectation is that this combination will improve induction efficacy considerably by working in a synergistic manner to create more lucid dreaming. Three of the six induction techniques in this project were given the highest marks in a recent systematic review (Stumbrys et al., 2012) and others were chosen because of their contribution to emphasizing WILDs.

**Design**

An exploratory, single-case study design was used for this project since the intervention is in the beginning stage of investigation. This style was also chosen because the project meets all three suggested circumstances for a case study design (Yin, 2014): the main research question falls under the *how* category, the researcher has little control over the behavioral events, and the phenomenon being studied is not historical but contemporary. Participant-observation was elected as the source of evidence due to the highly subjective nature of the topic and this style would allow for coverage of the phenomenon immediately after it happens. For the topic of dreaming, real-time coverage is critical to research because dream memory has shown to fade quickly after awakening (Horton, 2011; Rosen, 2013). By using participant-observation, this project also provides insight into the context, which is accounted for in this case by monitoring many other personal variables that might possibly influence the outcome of lucid dreaming (Yin, 2014).

The independent variable of this project was the proposed intervention that blends together four to six different lucid dream induction techniques, depending on how one defines them. The dependent variable that was measured was the amount of lucidity that occurred while dreaming during the 2-week time period. There were also several confounding variables that were monitored throughout the project that showed to affect either dreaming in general or lucid dreaming specifically. These included: sleep schedule (Levitan, 1990a), amount of time spent playing video games (Gackenbach, 2006; Gackenbach, 2009), as well as any ingestion of mind-altering substances such as prescriptions, vitamins, and supplements (Yuschak, 2006; LaBerge, 2004).

If the results showed no difference in the amount of lucid dreaming during the 2-week timeframe of utilizing the intervention, then the null hypothesis would be confirmed. The alternative hypothesis was that an increase in dream lucidity would take place during the intervention period, as compared to previous experience. A combination of dream journaling, an independent judge, and an instrument known as the LuCiD scale was be used to determine whether there was an increase in lucid dreaming or not. A series of descriptive statistical analyses was used on the LuCiD scale including ANOVAs and a MANOVA. A one-way, between-groups ANOVA was used on each subscale of the LuCiD scale survey to compare the non-lucid dreams to the lucid dreams. These numbers were compared to previous LuCiD scale research to decipher the similarities and differences. This plan was to either confirm or deny the validity of the dream lucidity experienced, and the opinion of the independent judge added to this decision.

Theoretical and practical implications of this project included establishing an improved technique for the induction of lucid dreaming, specifically for WILDs. If validated, this technique could theoretically be used in future research to study the phenomenon in a more reliable manner. Although, a more practical outcome would result by the mere adding of knowledge into the scientific database of lucid dreaming induction techniques.

**Lucid Dreaming Techniques**

 **Tholey’s combined techniques.** Tholey’s (1983) combined technique blends together elements of reflection, intention, and autosuggestion but, like most other induction techniques, has received little empirical validation. It has only been scrutinized by the scientific eye in a couple of studies, although the outcomes of these show encouraging results for the aspiring lucid dreamer (Paulsson & Parker, 2006; Zadra, Donderi, & Pihl, 1992). One of the studies found that by utilizing this technique over the course of 6 weeks, lucid dreamers with a wide range of experience were able to increase their dream lucidity up to a level that was statistically significant when compared to controls that did not use the technique (Zadra, Donderi, & Pihl, 1992). This effect was also shown to be significantly stronger for those who had prior lucid dreaming experience when compared to those who had no prior experience with the phenomenon. Paulsson and Parker (2006) expanded on this study by shortening the intervention time to 2 weeks and still found a significant increase in lucid dreaming within their group of 20 participants, some of whom had never experienced a lucid dream before. Also, 4 of the experienced participants reported a high degree of lucidity during the intervention.

This technique that Tholey (1983) began decades ago has evolved over time into a combination of reflection, intention, and autosuggestion. All of these strategies have shown to be mildly effective when used separately, but much more powerful when combined together (Stumbrys et al., 2012). The Mneumonic-Induction-of-Lucid-Dream (MILD) technique, developed by LaBerge (as cited in LaBerge & Rheingold, 1990), combines all three of these elements as well but in a slightly different manner, and it has been one of the most successful induction techniques that has also been tested a multitude of times (Levitan, 1989; Levitan & LaBerge, 1994; LaBerge 1980a; LaBerge, 1988; LaBerge & Levitan, 1995; LaBerge, Phillips, & Levitan, 1994). In order to elucidate the contribution of each one of these elements to the technique, they will be covered here individually in a concise manner.

***Reflection.*** In a systematic review of induction techniques, reflection by itself was given the highest grade of *green* on a scale of *red* to *yellow* to *green* (Stumbrys et al., 2012). It involves developing a contemplative frame of mind about one’s perceptions and, when trying to induce lucid dreaming, this reflection is best exercised through the technique of reality checks. This involves frequently asking oneself throughout the day whether one is in a dream or not and searching for possible evidence that the answer is yes (Tholey, 1983). Reality-checks have shown to be an effective induction technique on their own and they have been researched more extensively than most other induction techniques (Stumbrys et al., 2012). Physiologically, it makes sense that reality-checking would assist in dreaming lucidly because this kind of mental activity is associated with self-reflective awareness, and the part of the brain linked with this capability has shown to activate during lucid dreaming (Dresler et al., 2012).

***Intention.*** A grade of *green* was also given to intention as a technique used to induce lucid dreams by itself (Stumbrys et al., 2012), although it appears to be less effective than reflection (Schlag-Gies, 1992). The intention part of Tholey’s (date) combined technique consists of envisioning that one is dreaming even if awake. During this time, one visualizes recognizing the dream and following through with the intended actions for the lucid dream. This should be done occasionally throughout the day and much more before falling asleep at night (Tholey, 1983). In the morning, one should also set the intention to recognize certain instances throughout the day as opportunities to become more aware of experiences such as a feeling of bizarreness or experiencing a powerful emotion. This practice exercises the prospective memory, which is used to remember future intentions (LaBerge & Rheingold, 1990).

***Autosuggestion and posthypnotic suggestion.*** By itself, autosuggestion was only given a *yellow* in the systematic review of induction techniques (Stumbrys et al., 2012), but others found that it produced similar effects on intention (Schlag-Gies, 1992). In regards to the phenomenon of lucid dreaming, autosuggestion is the act of simply telling oneself to dream lucidly. For best results, it should be used within a relaxed state such as when falling asleep. An important part of this technique is refraining from any effort of will while suggesting to oneself that the next dream will contain lucidity (Tholey, 1983). It worked better for the frequent lucid dreamers of one study, but the effects were still not shown to be significant even for this group (Levitan, 1989). There are a couple of individuals who have had remarkable success with this technique, averaging around five lucid dreams a month with it (Garfield, 1979; LaBerge, 1980a), but these particular persons were also highly motivated and, thus, not the average dreamer. Alone, autosuggestion is not a great induction technique, but when combined with reflection and intention it makes a powerful tool for inducing dream lucidity.

Posthypnotic type of suggestion is essentially autosuggestion within a hypnotized or relaxed state (Dane, 1984). Someone else can give the suggestion to a hypnotized person or people can use it on themselves while in a deep state of relaxation. Doing this in such a relaxed state tends to increase the power of the suggestion, resulting in stronger effects (LaBerge & Rheingold, 1990). Tart (1988) noted that a, “very high degree of control is possible with posthypnotic suggestion” (p. 99), which is an ideal characteristic of an induction technique for the aspiring lucid dreamer. It was given a *yellow* in the systematic review of induction techniques (Stumbrys et al, 2012), but this is to be expected since autosuggestion was given the same grade. Posthypnotic suggestion is essentially covered under the autosuggestion part of Tholey’s combined technique in which one of the steps is to tell oneself that the next dream will be lucid while falling asleep (Tholey, 1983). Since it is happening during the stages of deep relaxation right before sleep, this would qualify as posthypnotic suggestion, or hypnagogic affirmation depending on the source (Morley, 2013).

**Reality-testing.** Reality-testing is the reflection facet of Tholey’s (1983) combined technique put into action, so it could be counted as a separate technique or as part of a whole depending on how one wants to divide them. Usually it is paired with another technique such as external stimulation, but it has been tested by itself multiple times and results showed an increase in dream lucidity (Dane, 1984; Levitan, 1989; Levitan & LaBerge, 1994; Purcell, 1988; Purcell, Mullington, Moffitt, Hoffmann, & Pigeau, 1986; Schlag-Gies, 1992). None of these increases were drastic and one study even found no effect when it was used (LaBerge, 1988), but overall it does seem to be better than many other induction techniques (Stumbrys et al., 2012). In order to get results, most recommend using it at least 5-10 times a day, with more always being better (Levitan & LaBerge, 1994; Tholey, 1983). It might take several days or weeks before fully experiencing its effects (LaBerge & Rheingold, 1990), but this lag is probably because creating a new mental habit and way of viewing reality can take a while before it starts to feel natural.

**Wake-back-to-bed.** Most names of lucid dreaming induction techniques are self-explanatory and the Wake-Back-To-Bed (WBTB) follows this pattern. WBTB requires the participant to awake after a period of sleep, stay awake for a while, and then fall back asleep attempting to dream lucidly (LaBerge et al., 1994). It is suggested that the participant wait until after getting 4-6 hours of sleep before trying this technique, and the reasoning behind this is twofold. One is so the participant is not tired since lucid dreaming takes a level of mental effort difficult to achieve when fatigued. The another reason is for timing purposes because most of the restorative deep sleep happens in the beginning of the night and most of the Rapid-Eye-Movement (REM) sleep happens afterwards in the early morning. REM sleep is ideal for those looking to dream lucidly because it has shown to be the stage when a majority of lucid dreams take place (Holzinger, LaBerge, & Levitan, 2006).

After awakening, participants are told to remain awake while engaging in quiet, non-intensive activities for a certain amount of time (LaBerge et al., 1994). Staying awake allows the participant to become alert, reactivating parts of the brain that were inactive during the previous sleep session and crucial for developing dream lucidity in the next session. The prefrontal cortex, for example, remains relatively inactive during deep sleep but has high amounts of activation when dreaming lucidly (Dresler et al., 2012). Theoretically, this reactivation from awakening carries over into the next sleep session and increases the probability of experiencing a lucid dream. Timing of this arousal is critical though as too much produces insomnia and too little leads to falling asleep unconsciously again.

 A series of tests were conducted in order to decipher the precise timing that should be used for this technique (Edelstein & LaBerge, 1992; LaBerge et al., 1994; Levitan, 1990a; Levitan, 1990b; Levitan, 1991; Levitan, LaBerge, & Dole, 1992). When comparing morning naps to afternoon naps, the morning naps contained more lucidity per dream but both groups showed an increase in lucid dreaming over the night sleeping (Levitan, 1990a). In another study, none of the participants had lucid dreams while taking an afternoon nap but almost all of them experienced dream lucidity during their morning naps (Levitan et al., 1992). The average time spent asleep in these naps was roughly 1 hour while the nap length for the other study was 2 hours (Levitan, 1990a). A third study used a nap length of 90 minutes at three different times of the morning: after waking early to stay awake for a while, waking early then immediately napping, and after waking naturally. Lucid dreaming was experienced the most in the first condition of waking up early, staying awake for a while, and then taking the 90 minute nap, occurring in 2/3 of the participants (Levitan, 1991).

Precision of this technique was honed through testing what length of time would be best to stay awake before taking a nap (Edelstein & LaBerge, 1992; LaBerge et al., 1994). Unfortunately, ambiguity of instruction led to confounding outcomes for one of the studies that compared wakeful periods of 10 minutes versus 90 minutes (Edelstein & LaBerge, 1992). The other did a comparison of three varying wakeful periods: 10 minutes, 30 minutes, and 60 minutes. Longer periods of wakefulness correlated with many more lucid dreams than the short period, nearly quadrupling the amount of lucid dreaming found in the 10 minute period (LaBerge et al., 1994). Sixty minutes of being awake resulted in slightly more dream lucidity than 30 minutes, so that is what was used for this project. Using the WBTB technique improves the odds of inducing WILDs because they are more likely to occur in naps regardless of whether they are in the morning or afternoon and, since this project is focused on WILDs, the WBTB technique was chosen specifically for its unique capabilities at inducing this type of lucid dream.

**Mindfulness meditation.** Meditation and lucid dreaming seem to share many psychological and physiological characteristics (Alexander, 1987; Gackenbach, 1990), and some have even argued that lucid dreaming is a kind of meditational state itself (Gackenbach & Hunt, 1992). Meditation has shown to be positively correlated with lucid dreaming (Gackenbach, Cranson, & Alexander, 1986). One study found that lucid dreaming occurred more often in meditators than in non-meditators with long-term practitioners experiencing the most (Mason et al., 1997). This outcome is not the intention of meditators; however, meditating enhances one’s ability to dream lucidly because it builds the mental habits necessary for experiencing that particular state of mind. One of these mental habits, which is key to lucid dreaming, is mindfulness.

Mindfulness is described as having two main components: self-regulation of attention on immediate experience and an attitude of openness (Bishop et al., 2004). Morley (2013) explained it more simply by saying that mindfulness is, “knowing what is happening, while it is happening, without preference” (p. 89). His reasoning behind its efficacy as an induction technique stems from the continuity hypothesis of dreaming (Hobson & Schredl, 2011). The thought is that mindful awareness during the day turns into mindful awareness at night, thus, inducing dream lucidity. He also claimed that mindfulness meditation is the original lucid dream induction technique and, although this is surely not the case, it likely precedes almost all methods that have been concocted to date. Hunt (1989) shed light on this connection by explaining that lucid dreaming, “entails the same tenuous balance between our ordinary attitude of active participation…and that attitude of detached receptivity that characterizes the goal of long-term meditation practice” (p. 120).

In those studies that have shown connections between meditation and lucid dreaming, the protocol for meditation has been through to be a program referred to as Transcendental Meditation (Gackenbach et al., 1986; Mason et al., 1997). However, due to time constraints and financial restrictions, this precise program was not used for the project at hand. Instead, a practice of mindfulness meditation was exercised. Transcendental Meditation and mindfulness meditation appear to be comparable on a phenomenological level since the former, “allows your mind to effortlessly settle inward, through quieter levels of thought, until you transcend the thinking process and experience the most silent and peaceful level of your own awareness” (Maharishi Foundation, 2014), while the latter is said to be an, “ideal meditation practice for lucid dreaming [by] settling the mind in its natural state…you do not alter or control any of the mental phenomena that appear to you…you simply pay attention to everything that arises without grasping” (Wallace, 2012, p. 63).

One of the only major differences between these two types of meditation is the use of a mantra in the Transcendental method. Shinzen (Young ,1998) commented on this when he said, “mindfulness meditation in essence turns each ordinary experience into a mantra” (Mantra practice vs. mindfulness, paragraph 5). The overall likeness of these meditation techniques means that using mindfulness meditation in this scenario should produce results of dream lucidity akin to those found with Transcendental Meditation. A recent study supports this theory by showing that meditation is correlated with lucid dreaming, regardless of the method (Sparrow, Thurston, & Carlson, 2013). According to Gackenbach (2010), meditation significantly surpasses other lucid dream induction techniques, though dream lucidity is merely a by-product of the practice and not the goal.

**Sleeping-lion posture.** A series of sleeping postures have been used by the Tibetan Buddhists for centuries as a way to assist the induction of lucid dreaming (Katz, 2011; Rinpoche, 2002; Dalai Lama XIV, 1997), however, this project only focused on one of them. It is one of the main positions referred to as the sleeping-lion posture, and it consists of lying on one’s side with the head facing north (Norbu, 2002). Males are to sleep on their right side and females on their left due to the reversal of position in solar and lunar channels between sexes. Legs are together with a slight bend at the knee, and one hand is under the pillow while the other rests on top of the legs (Wangyal, 1998). Some say to close both nostrils (Evans-Wentz, 1958) while others say to close only the right nostril (Norbu), and still others claim that the nostril of closure depends on the sex (Wangyal, 1998). As seen, the details of this posture technique remain disputed (LaBerge, 2003), and unfortunately science has yet to settle any of these arguments through experimentation.

Science, at this point in time, cannot provide any definite answers about the efficacy of this sleeping-lion posture technique at inducing dream lucidity because there has only been one study to date that has investigated it. In 1991, LaBerge and Levitan published findings from a pilot study they conducted exploring this precise topic. They found that lucid dreaming was 3 times more likely to occur to those sleeping on their right side as opposed to their left. Additionally, this result was not specific to sex so females experienced more dream lucidity while on their right side, too, not just males as the texts have said. Another result of the pilot study sheds some light on the issue of nasal laterality. Women were 3 times more likely to experience dream lucidity when they dilated their left nostril and not their right, but this finding did not hold up for males. These small numbers demonstrate the weak potency of this technique, but they are encouraging as they make a step in the direction towards dream lucidity (LaBerge & Levitan, 1991).

**Hypnagogic transition.** Hypnagogia are the hallucinations commonly experienced when transitioning from the waking state into dreaming, and they can be visual, auditory, or even somatic (Laberge & DeGarcia, 2000). To date, concentrating on hypnagogia as a lucid dream induction technique has not been tested empirically, but it has received good reviews anecdotally (LaBerge & Rheingold, 1990; Tholey, 1983). The authors of a recent systematic review of induction techniques even mentioned that it warrants further investigation because of its ability to produce WILDs (Stumbrys et al., 2012), which is the main reason that is was added to the repertoire of techniques of this project.

Compared to other induction techniques, hypnagogia has received little attention with only a couple authors describing their process of utilizing hypnagogic hallucinations to initiate dream lucidity. Of these authors, LaBerge and Rheingold (1990), Tholey (1983), and Morley (2013) have made some of the most excellent contributions to this subject matter. After reviewing what each one had to say, a pattern emerged that follows the same relative steps of relaxing, observing passively, and entering the dream lucidly.

Of the three authors, Tholey (1982; 1983; 1989) was the first to address this technique of hypnagogic induction and has written the most extensively on the topic. According to him, a critical component of this approach is holding the stance of a detached observer. He expands on the rationale behind this saying that one should not seek the scenery actively because this usually causes it to disappear**.** To remedy this, he suggested that a passive stance be taken towards the dream and one will drift into it**.** LaBerge and Rheingold (1990) echoed this emphasis on nonparticipation stating, “Do not try to actively enter the dream scene, but instead continue to take a detached interest in the imagery” (p. 99). Remaining passive all the way up to the point of dream entry and further seems to be an important aspect of this technique.

A more recent publication by Morley (2013) elucidates the mechanism that makes this technique generate lucid dreaming, asserting that, “the imagery is your mindfulness support and is used to keep the thread of your awareness engaged while the rest of you falls asleep” (p. 100). Rinpoche (2002), from the religion of Tibetan-Buddhism, expounded on this metaphor saying hypnagogia, “are the cause of dreams, so if you recognize them, like inserting a thread through the eye of a needle, you will continue to dream” (p. 81). Other methods besides hypnagogic imagery have been used to entertain the mind while the body falls asleep such as counting or breathing (Levitan, 1991), but none have shown a high degree of success. During the transition, hypnagogic hallucinations become progressively more intense and intertwined until a vivid scenario evolves into a fully-formed dream. This gradual construction of hypnagogia is acknowledged by each author with a unanimous agreement that an attitude of detached observation should be engaged at this time (LaBerge & Rheingold, 1990; Morley, 2013; Tholey, 1983). This mentality should persist until after a fully-developed dream is apparent, an event that might be accompanied by feelings of kinesthetic movement (Morley, 2013). Once the dreamer has faith in the stability of the surrounding environment, he or she can start to exert influence over the dream content and proceed with any intended actions.

**Method**

**Participant**

The only participant in this project was myself, Elliott Gish, making it a case study design. I made a good candidate for participation because I have little lucid dreaming experience, which is an ideal characteristic for testing the efficacy of an induction technique. Therefore, there is no need to discuss recruitment procedures since none were utilized for this project.

**Handedness.** Handedness has been linked with dream recall (Schredl, Beaton, Henley-Einion, & Blagrove, 2013) so it has been included here as an extra measure because dream recall has shown to be correlated with frequency of dream lucidity (Schredl & Erlacher, 2004a; Schredl & Erlacher, 2011). For the aspiring lucid dreamer, dream recall is an ability that is imperative to succeeding and this makes sense because people can have lucid dreams but not remember them if their dream memory skills are poor. I am right-handed so, according to the cited study, this predisposes me to having higher dream recall than a left-handed person and, thus, possibly more lucidity.

**Gender.** Some researchers such as Gackenbach (1981, 1990) have claimed a gender difference in lucid dreaming, although there have been several large-scale studies that have not found this to be true (Erlacher et al., 2008; Gruber, Steffen, & Vonderhaar, 1995; Schredl & Erlacher, 2004a; Stepansky et al., 1998). Differences have been found favoring women, but only one has shown a significant difference (Schredl & Erlacher, 2011). Dream recall might be the factor affecting this difference since a recent meta-analysis including over 40,000 participants did show that women remember their dreams more often than men (Schredl & Reinhard, 2008). Being a male, I might have been at a slight disadvantage for this project, but I do not see this as interfering with results much because I have a high dream recall (Schredl & Erlacher, 2004b), which should negate the gender difference found amongst lucid dreamers.

**Age.** Many studies have found no differences in age and frequency of lucid dreaming (Doll, Gittler, & Holzinger, 2009; Erlacher et al., 2011; Mota-Rolim et al., 2013). However, there are also many others who have found it to be negatively correlated with age (Blackmore, 1984; Schredl & Erlacher, 2004a,; Schredl & Erlacher, 2011; Watson, 2001). This variance might be accounted for, in part, by dream recall, as several studies have found as people age there is an inverse relationship with dream recall (Schredl, 2008; Stepansky et al., 1998), including the previously mentioned meta-analysis with over 40,000 participants (Schredl & Reinhard, 2008). Although, this issue of dream recall and age is controversial because others have found no relationship between the two (Schredl & Piel, 2003; Voss, Frenzel, Koppehele-Gossel, & Hobson, 2012), this surely could not fully explain a possible age effect on lucid dream frequency.

 Inconsistencies in this area of lucid dreaming could be prompted by other factors that have shown to greatly influence dreaming such as culture (Laughlin, 2011) or one’s attitude towards dreams (Schredl, Ciric, Götz, & Wittmann, 2003), both of which will be discussed later. Overall, age does not appear to be extremely influential in the sphere of lucid dreaming, but I will still make my personal information on this matter available for the project: I am 24 years old, meaning that lucid dreaming might be easier for me than older populations.

**Dream recall.** A number of studies have found a significant correlation between dream recall frequency and lucid dreaming frequency (Doll et al., 2009; Erlacher et al., 2008; Erlacher & Schredl, 2011; Schredl & Erlacher, 2004a; Voss et al., 2012). Dream recall has shown to have one of the strongest relationships to lucid dreaming to date, standing the test of replication repeatedly. These findings are not surprising since a lucid dream is simply a dream accompanied by some insight and awareness, so their frequencies are likely to be related.

There are many other variables that interact with dream recall, as well, like age (Stepansky et al., 1998), gender (Schredl & Piel, 2003), setting (Schredl, 2008), attitude towards dreams (Schredl & Doll, 2001), and openness to experience (Watson, 2003). The ability to recall dreams appears quite variable, even within the same individual (Conesa 2002), and, thus, should be measured when experimenting with lucid dreaming in order to determine its contribution to the findings. To know of such a robust relationship in the field and still not track it during an investigation would be unprofessional; therefore, I kept track of all my dreams that I remembered during this project by writing them down in order to keep count of my recall.

**Prior experience.** According to Paulsson and Parker (2006), Tholey’s (1983) combined technique produced better results for those who had previous experience with lucid dreaming. They had more lucid dreams in addition to higher degrees of lucidity throughout the intervention. However, anyone who has had at least one lucid dream qualified as an *experienced* lucid dreamer, which depending on the survey, includes anywhere from 26-100% of the population (Erlacher et al., 2008): therefore, *experienced* is somewhat of a misnomer. Unfortunately, there have not been any other studies to my knowledge that measure the effect of prior lucid dreaming experience on the efficacy of induction techniques; for this reason, more research in this particular area is needed.

The old saying “practice makes perfect” would certainly seem to apply in this case since there are several anecdotal reports of this kind of learning curve happening amongst those who have experienced hundreds of lucid dreams (Garfield, 1979; LaBerge, 1980a; LaBerge & DeGracia, 2000; Waggoner, 2009). Personally, I am in a unique position because I have written down every lucid dream I remember having in my life, which has consisted of the last 40 months and 39 lucid dreams, averaging out to nearly one a month (Appendix B). My definition for a *lucid* dream during this time was the same one used for this project, too, although I am unsure of whether the amount I have experienced defines me as *experienced* or not. The spikes seen in January and February of 2014 in Figure 1 are very likely due to month-long tests of induction techniques, which included supplements and sleeping positions.

**Fig. 1.** Lucid dreaming history of participant

**Culture.** Tart (1988) spoke on this subject articulately when he said, “the experimenters and the subjects have been acculturated within a specific culture to share a relatively common set of views, including attitudes about the importance of dreams, their nature, and the degree to which they can be deliberately controlled” (p. 71). Due to these cultural variations, some people experience lucid dreams more frequently than others. Studies measuring the average rates of lucid dreaming in countries around the world demonstrate the substantial contribution of culture to the phenomenon. In Switzerland, it is reported that 26% of the population have a lucid dream at least once a month (Fingerlin, 2013) while, in Japan, only 8.4% of the population experiences it at this rate (Erlacher et al., 2008). The Swiss population seems to experience about 3 times as much lucid dreaming as the Japanese population, providing evidence for the impact of culture on dream lucidity. Brazil appears to have even more lucid dreaming than Switzerland with a reported 12.2% of population experiencing it at a rate of at least once a week, as opposed to once a month (Mota-Rolim et al., 2013).

Laughlin (2011) recognized this discrepancy of cultural dream lucidity in his extensive dreaming anthropology, saying, “culture has an enormous influence on lucidity and how lucidity is used by the dreamer” (p.161). Culture has a great impact over how often people will experience lucid dreaming, but the reason behind this remains unknown. One educated guess to explain this connection is through the mediation of dream recall. Culture affects one’s attitude towards dreams, and, not-surprisingly, one’s attitude towards dreams is correlated with one’s ability to recall them (Schredl, Ciric, Götz, & Wittmann, 2003). Dream recall, in turn, impacts rates of lucid dreaming through the aptitude of memory. To gauge my cultural perspective for this project, I have included my personal information on the matter. I was born and raised in the United States of America, in a household that put little value on dreams so they were rarely discussed. I currently reside in the state of Colorado.

 **Attitude toward dreams.** There are only a couple traits that have shown to reliably alter people’s dream recall, and one of them is their attitudes toward dreams (Cernovsky, 1984; Rochlen, Ligiero, Hill, & Heaton, 1999; Schredl, Ciric, Götz, & Wittmann, 2003; Schredl & Doll, 2001; Schredl, Nuernberg, & Weiler, 1996). In a meta-analysis, other factors effecting dream recall, such as *absorption* and *thin boundaries*, were attributed to secondary causes like measurement, but the effect of one’s *attitude toward dreams* was consistent in influencing one’s ability to recall dreams (Beaulieu-Prevost & Zadra, 2007). This relationship appears to remain even when it is studied anthropologically as Laughlin (2011) commented on multiple societies that that will not tolerate a member of the community forgetting his or her dreams: they will either kick the person out or consider the person a mental and emotional cripple. It is probably safe to assume that everyone in this kind of dreaming culture remembers his or her dreams on a regular basis. Having this type of attitude toward dreams would encourage this behavior due to the stigma of its alternative.

LaBerge (in LaBerge & Rheingold, 1990) touched on this issue of attitude and its effect on lucid dreaming by emphasizing *adequate motivation* as one of the three basic requirements for experiencing dream lucidity on a habitual basis. Without taking any surveys, I know that I fall on the positive end of the spectrum regarding attitude toward dreams because I think dreams hold incredible potential to change lives. I believe a lot can be learned from them and more time should be spent investigating them, individually as well as scientifically. This positive attitude toward dreams of mine should be noted as a possible influence on my dream recall and, in turn, my lucid dream recall. However, the effect is more than likely minimal (Schredl, Brenner, & Faul, 2002).

**Personality.** Personality traits that are directly associated with lucid dreaming remain debatable. Although several studies have investigated the subject, their mixed results make for vague conclusions. Field independence, for example, has shown to be correlated with rates of lucid dreaming (Patrick & Durndell, 2004), but has also shown to not be correlated with it either (Blagrove & Tucker, 1994). This incongruity has happened with the dimension of creativity as well, showing both a significant correlation with lucid dreaming (Blagrove & Hartnell, 2000) as well as no difference at all (Blagrove & Tucker, 1994). Two aspects of personality that show the most stable connection to lucid dreaming are a need for cognition and an internal locus of control. A need for cognition was correlated with high amounts of lucid dreaming in two different studies (Patrick & Durndell, 2004; Blagrove & Hartnell, 2000), but the samples for both of these were fairly small at 22 and 24 participants, respectively. These studies, along with a study mentioned earlier (Blagrove & Tucker, 1994), also showed a significant difference in locus of control with lucid dreamers being more internal.

Openness to experience is another characteristic of personality linked with lucid dreaming (Schredl & Erlacher, 2004a), but it has also been correlated more generally with dream recall on multiple occasions (Schredl, Ciric, Götz, & Wittmann, 2003; Watson, 2003). Since dream recall frequency affects one’s frequency of lucid dreaming, it might account for the relationship that dream lucidity has with openness to experience. Overall, the correlation between certain personality traits and lucid dreaming frequency seems rather small. Also, most of the connection they share can be explained through the mediator of dream recall (Schredl & Erlacher, 2004a). As a result, personality was not taken into consideration as a factor in this project.

**Video-gaming.** One hobby that has shown to be associated with lucid dreaming is video-gaming. More broadly, interactive media use has shown a connection to experiencing lucid dreams, and video-gaming is one of the most interactive forms of media available (Gackenbach, 2010). It is thought that absorption is a key factor in this connection, engaging players in a way that makes them feel truly involved in the virtual reality of the game (Gackenbach, 2006). This outlet offers the participants an experience with a virtual-reality, which can translate to improving their skills at navigating various realities other than the waking state, such as lucid dreaming (Gackenbach, 2009).

Video games have shown such a strong link to lucid dreaming that one individual went so far as to create a video game about it where the goals are related to inducing lucid dreams (Penderson, 2013), although it has yet to be tested empirically. Since I play video games on a regular basis and I am in the 87th percentile of the Tellegen Absorption Scale (Tellegen & Atkinson, 1974), I kept track of the amount of time I spent playing each day throughout this project to calculate its contribution.

**Individual differences.** Lucid dreaming can be defined in many ways because it covers a wide range of dreaming phenomena. This breadth of experience is so large that lucid dreaming can be quite different depending on the individual and his or her talents. A chapter written by LaBerge and DeGarcia (2000) is exemplary at illustrating this principle by comparing the personal lucid dream records of the authors. One of the most striking differences came from the way they induced their lucid dreams with DeGarcia having WILDs for 43% of his 114 lucid dreams while LaBerge’s WILDs only made up 8% of his 388 lucid dreams (2000).

Prior experience with lucid dreaming is an important individual difference to take into account because it typically makes them easier to induce (Zadra, Donderi, & Pihl, 1992) and last longer (LaBerge & DeGarcia, 2000). When people have their first lucid dreams, the lucidity usually only lasts a few seconds before the dreamer is pulled back into non-lucidity or wakes from excitement of the feeling (LaBerge & Rheingold, 1990). “With experience, some lucid dreamers learn to maintain lucidity without any special effort,” (LaBerge & DeGarcia, 2000, p. 303) like LaBerge, who gradually became better at not losing lucidity during the three years of his doctoral dissertation. Throughout the first year, 18% of the dreams lost their lucidity, but only 1% did during the second year, and a mere 0.4% during the third year. However, this is not always the case as can be seen by looking at DeGarcia’s increasing records of lost lucidity from 17% in year one to 21% in year two, and 40% in year three (2000).

It is not only the length and strength of lucidity that can be dissimilar among individuals: there can also be differences in lucid dream content, as well. Overall, LaBerge and DeGarcia (2000) explained that LaBerge had much more environmental imagery than DeGarcia as evidenced by their percentages of lucid dreams containing only a void: 32% for DeGarcia and 3% for LaBerge. Skills are another factor contributing to the individual differences of lucid dreaming. Synder and Gackenbach (1988) suggested that people who are better at spatial and vestibular activities are predisposed to experience more lucid dreams than others who do not share these aptitudes. The bottom line of this section is to demonstrate that whether or not the findings of this project show success at inducing lucid dreaming, it should be kept in mind that the results could be the product of individual experience and may not be generalizable.

**Measurement Instruments**

To measure dream lucidity, I used the newly-developed Lucidity and Consciousness in Dreams (LuCiD) scale survey as it seems to be the most valid instrument developed to date in regards to this phenomenon. I do have some qualms with the wording on a few questions but, for the sake of standardization, the instrument was used, as is, for this project. Dream journal entries were also read by an independent judge, Dr. Ian Wickaramasekera II, to verify instances of the phenomenon in question. Measuring dream lucidity with a combination of instruments such as the dream journal, independent judge, and LuCiD scale survey, allowed for a more accurate outcome than if only one was used on its own. Through data triangulation like this, construct validity of the study was increased (Yin, 2014), which was needed for this particular project design due to its lack of validity. Other factors shown to influence dream lucidity were recorded such as the timing of sleep cycles, time spent playing video games, and ingestion of brain-altering substances like caffeine. Additionally, the dream was rated as lucid or not by myself in addition to distinguishing whether it felt like a DILD or a WILD.

**Dream journal.** Amongst the instruments that have been constructed to measure dreaming, the old-fashioned dream journal still seems to be one of the best. Robert and Zadra (2008) demonstrated that retrospective reports in dream research, such as monthly estimate questionnaires, are far more inaccurate than their prospective counterparts that measure the phenomenon on a more constant basis, such as dream journaling. This should come as no surprise since dream memory fades quickly (Horton, 2011; Rosen, 2013) and memory in general can be quite faulty at times (Storbeck & Clore, 2005). A study comparing dream journaling to dream questionnaires revealed a clear distinction between the two measures when it showed dream journals to be more accurate in several ways (Schredl, 2002). As an instrument, dream questionnaires lack comparable validity to the dream journal so if a study about dreams needs to improve this area, such as this project, then the dream journal is the choice to make. One study that compared dream journaling to another prospective measure, which was a checklist log, reported more accuracy for dream journaling as well (Zadra & Robert, 2012).

**Independent judge.** Dreaming is extremely subjective by nature: as a result, studying it in an objective manner can be a significant challenge. Being as objective as possible is important to producing reliable, valid results, especially within the field of lucid dreaming. Using independent judges can assist in this process of generating impartial findings because they do not have any vested interest in obtaining certain results; therefore, the chance of them biasing the data is minimal (Creswell, 2009). An independent judge can be used as a way to validate participant reports, which, in this case, would be instances of the phenomenon lucid dreaming and how it was induced. Due to the case study design, this project needed as much validity as possible so it was decided to add an independent judge who verified instances of the phenomenon in question.

Ignorance is another problem for this specific field of research that can be helped with the use of an independent judge because not everyone knows exactly what a lucid dream entails. As a consequence, people will claim to have lucid dreams when they really do not. This lack of awareness can lead to drastically different results during studies since the participants are confused, sometimes unknowingly, about what they are reporting. Multiple researchers have brought up this issue of unfamiliarity (Bogzaran & Deslauriers, 2012; Hobson, Pace-Schott, & Stickgold, 2000; Schredl & Erlacher, 2003) suggesting various solutions, including the use of nonbiased and knowledgeable persons for judging the outcomes. For purposes of this project, Dr. Ian Wickaramasekera II was chosen to be the independent judge because he has studied lucid dreaming both personally and professionally; he is well-informed on the topic. Being well-educated granted him the ability to distinguish various nuances of the experience, which was important for this project, since it investigated certain types of lucid dreaming.

**LuCiD scale survey.** The Lucidity and Consciousness in Dreams scale (Appendix A) contains 28 questions that measure various dimensions of lucidity and primary consciousness during the dream state. These aspects are broken down into eight categories: insight, control, thought, realism, memory, dissociation, negative emotion, and positive emotion. Each question is a 6-point Likert scale ranging from “strongly disagree” at zero to “strongly agree” at a 5 rating. Reliability of these subscales was good overall, exceeding 0.75 (Cronbach’s alpha) on all but three: dissociation, negative emotion, and memory. Insight, control, thought, and positive emotion are the subscales that show the largest difference between lucid and non-lucid dreams so low that reliability on those others is not much of a concern. Construct validity for this scale was verified using both exploratory and confirmatory factor analyses, meaning that it does indeed measure lucid dreaming (Voss, Scheremelleh-Engel, Windt, Frenzel, & Hobson, 2013).

 This LuCiD scale survey was chosen over other instruments measuring this phenomenon, the Dream Lucidity Questionnaire (DLQ) and the Metacognitive, Affective, and Cognitive Experience questionnaire (MACE). The DLQ was constructed to deal more directly with lucid dreaming by measuring levels of one’s awareness, control, and remembrance (Stumbrys, Erlacher, & Schredl, 2013) but it is only 10 questions long and does not measure certain facets of the experience such as emotion, which is primarily positive (Voss et al., 2013). The MACE was constructed to measure various characteristics of cognition that could be compared across states of consciousness such as sleeping, dreaming, and waking (Kahan, LaBerge, Levitan, Zimbardo, 1997). It was not chosen for this project because the primary elements, namely metacognition, cognition, and reflection, are also incorporated in the LuCiD scale survey. Additionally, control is not measured with the MACE and, even though it is not in the strict definition of lucid dreaming, it is regarded as a significant part of achieving high levels of dream lucidity (Dresler et al., 2014; Prescott & Pettigrew, 1995; Voss et al., 2012). Since dream lucidity is more of a continuum, as discussed before, measuring this extra component provided more information about the degree of lucidity that was attained.

**Procedure**

For a time period of 14 consecutive days, I actively participated in the techniques mentioned above as a means of increasing my overall dream lucidity. A rough estimate of the daily amount of time spent on the activities of this project fell somewhere in the range of 2-3 hours. The process consisted of asking myself whether I was dreaming or not at least five to ten times a day (Tholey, 1983) and this was triggered by a random alarm from my phone, something bizarre happening, or the experience of powerful emotions.

Following this check, I imagined that I was dreaming and though about any recent activity that might have proven this to be true (Tholey, 1983). Whether or not I found it to be true, I followed this by attempting to remember my intended actions for the lucid dreaming scenario and proceed to visualize myself executing them (Paulsson & Parker, 2006). Since Transcendental Meditation is recommended for 20 minutes twice a day (Maharishi Foundation, 2014), Morley (2013) recommended mindfulness meditation for 20-30 minutes a day, and Wallace (2012) recommended at least 24 minutes a day. I practiced mindfulness meditation for 30 minutes twice a day throughout the 2-week time period of this project: once in the afternoon around 1-3pm and the other right before lying down to sleep at night. This was executed by sitting comfortably with my spine erect and continuously attending to my present experiences, being non-partial in my outlook to anything that arose.

An alarm was set to wake me up 6 hours after I went to bed so I could practice the additional techniques of WBTB, Tholey’s (1983) combined, and hypnagogic transition. Once awake, I remained awake for 60 minutes writing down my dreams and meditating before lying down again to attempt a lucid dream. For the purposes of this project, a target time duration of the naps of approximately 90 minutes was chosen based on prior research (Edelstein & LaBerge, 1992; LaBerge et al., 1994; Levitan, 1991), which also works well physiologically since it is the typical length of an early morning sleep cycle containing plenty of REM (Hobson, 2001). An alarm was set to wake me up 2 hours before I normally arise. It should be kept in mind that the WBTB method has only tested empirically in combination with the MILD technique, although this is not necessarily a problem for this project, in particular, because the MILD was essentially practiced through utilizing Tholey’s combined technique as they share many defining characteristics.

Afterwards, I assumed the body posture of sleeping-lion. On a personal note, I have also noticed myself awakening in this posture from lucid dreams on several occasions. Since the technique takes little effort to complete and provides some promising results, it has been added to the intervention of this project in hopes of boosting chances of lucid dreaming, if only a little. For the purposes of this project, the sleeping lion posture did not entail all the described intricacies. It was comprised of sleeping on my right side with the head facing north. Hands and legs were in their appropriate places as mentioned earlier, with no deliberate interference being made to my breathing since results on this aspect were inconclusive.

After I was in position, I paid attention to the hypnagogic hallucinations that appeared, focusing primarily on the imagery. An attitude of passive observation was adopted towards any perceptions that arose until the hypnagogic hallucinations manifested into a formed narrative situation capable of being classified as a dream. The sense of detached surveillance was sustained but slowly intermixed with minor efforts to influence content until both the dream and lucidity were solidified. Occasionally during this process, I thought about myself retaining awareness while dreaming and tried to avoid putting forth conscious effort into thinking it (Tholey, 1983). Upon awakening naturally approximately 90-120 minutes later, I immediately recorded my experience by writing it all down in a journal and then filling out a LuCiD scale survey (Voss et al., 2013). An alarm was set to make sure I did not exceed the 120-minute nap limit.

**Results**

Numbers from the dream journal indicate 39 dreams, of which three were lucid. Of these lucid dreams, two were labeled as WILDs and one was labeled as a DILD. Average word count for the dream reports was 370 with a high of 529 and a low of 251. The independent judge confirmed instances of lucid dreaming, agreeing with the participant in every case of dream lucidity. Additionally, the judge distinguished between WILDs and DILDs, confirming the opinions of the participant in each case as well. Therefore, discrepancies were nonexistent between the reports of the independent judge and the participant.

 For the LuCiD scale, a series of statistical analyses were used including a multivariate analysis of variance (MANOVA) and several one-way univariate analyses of variance (ANOVAs). The MANOVA revealed an effect that was significant at alpha level 0.10 for overall group differences between lucid and non-lucid dreams across all of the questionnaire’s subscales [F(1,14) = 3.277, p < .092]. Between groups analyses (ANOVAs) were performed for each subscale to determine which ones contained the largest differences when comparing the non-lucid dreams to the lucid dreams. Table 1 demonstrates these results, finding significant differences in the subscales of Insight, Control, Thought, and Memory, when using an alpha level of 0.05. Negative Emotion and Positive Emotion both revealed significance as well when an alpha of 0.10 was used. The only subscales showing no statistically-significant difference were Realism and Dissociation.

Table 1

*ANOVA of LuCiD subscales comparing lucid to non-lucid dream reports*

|  |  |  |  |
| --- | --- | --- | --- |
| Subscale | F | Df | P |
| INSIGHT | 503.7085 | 1, 10 | <0.01 |
| CONTROL | 95.30602 | 1, 8 | <0.01 |
| THOUGHT | 9.07441 | 1, 4 | 0.04 |
| REALISM | 0.207136 | 1, 4 | 0.67 |
| MEMORY | 6.202153 | 1, 6 | 0.05 |
| DISSOCIATION | 0.100554 | 1, 4 | 0.77 |
| NEGATIVE EMOTION | 13.448 | 1, 2 | 0.07 |
| POSITIVE EMOTION | 8.505105 | 1, 2 | 0.10 |

Figure 2, below, compares the mean scores for lucid versus non-lucid dream reports, showing the drastic difference of Insight and Control. The subscales of Memory and Positive Emotion also display a large gap between the two types of dreaming. Subscales showing the least variability between the non-lucid and lucid dreams were Thought and Realism. Dissociation and Negative Emotion were the only two subscales to exhibit higher scores for non-lucid dreams.

**Fig. 2.** Mean scores of LuCiD subscales for non-lucid versus lucid dream reports.

**Discussion**

Several possibly confounding variables were monitored throughout the project but, after examination, their effects on the outcomes seem minimal. Sleep schedule was one of these, but there was little variation of it throughout the project. The longest time difference between nights was 1 hour, meaning that it hardly affected the sleep cycles and probably did not alter the amount of lucid dreaming, either. Video-gaming is another possible variable adding to the equation of dream lucidity, but it is unlikely in this case as well since the average time spent playing each day was 1.14 hours. According to Gackenbach (2009), this is on the low end of interactive media use so its contribution to lucid dreaming was likely marginal if anything. It is safe to say that mind-altering substances had no effect on the outcome of this case study because none were ingested throughout its duration. I do not take vitamins, supplements, or prescription medications, but I do drink alcohol and coffee occasionally. However, I abstained from consuming them for the 2 weeks of this project, and since dependence of these is nonexistent for my person, their effects should not have influenced the findings in any way. The average word count of dream reports was also considered as a way of measuring the probability of them coming from REM sleep and, according to the figures in this project, they did (Stickgold, Pace-Schott, & Hobson, 1994).

**Comparisons**

 When the results of the LuCiD scale are compared to those found by Voss and her colleagues (2013), few differences are seen to exist. The Thought and Realism subscales show the most compatibility between Voss (2013) and this project. It has been argued that thinking is relatively the same across waking and dreaming (Kahan et al., 1997); therefore, it is reasonable to conclude that lucidity would not add much to the cognition category (Kahan & LaBerge, 1994). However, dreams are notorious for being bizarre, unrealistic scenarios so it is surprising that lucidity does not have much of an impact on this factor. The only subscales showing no statistically significant difference in this project were Realism—which follows the pattern of the previous study—and Dissociation, which has shown to be the most unreliable (Voss et al., 2013). The biggest difference came from the subscale Dissociation, showing higher levels in non-lucid dreams for this project but lower levels in non-lucid dreams in the Voss and colleagues (2013) study. However, Dissociation had the lowest reliability of all the subscales so this probably explains most of the difference, in addition to the incredibly small sample size of this project. The striking similarities overall are encouraging because their sample size was much bigger with 151 participants, thus conveying two messages. One message was that the LuCiD scale seems to be a reliable measure of dream lucidity and the other was that the lucid dreams experienced in this project seem to be legitimately lucid. Past research was further replicated in this project with the subscales of Memory and Positive Emotion, which displayed a large gap between the two types of dreaming (LaBerge, 2009; Voss et al., 2013). Investigation into the nature of dreaming (Hartmann, 2011) was also supported in this project with the only two subscales that exhibited higher scores for non-lucid dreams being Dissociation and Negative Emotion.

Dream recall during this 2-week period amounted to 39 dreams total, or 2.79 a night on average. This is considered high dream recall (Schredl & Reinhard, 2008) and, since dream recall frequency is correlated with lucid dream frequency, this means I should be on the higher end of lucid dream frequency, as well. Someone on the high end of lucid dreaming should experience it at least once a month (Patrick & Durndell, 2004) and my overall average is close with 39 lucid dreams in 40 months. With this in mind, the findings of this study show promising effects for the *combination of induction techniques* that was used because three lucid dreams were experienced within the 2-week period. This number is already higher than my average and could, theoretically, produce the similar results for another 2 weeks, which would mean roughly six lucid dreams a month. While these numbers are inspiring, there is little evidence that it is effective at inducing WILDs since only two were experienced during the timeframe. This is somewhat disheartening given that WILDs were the goal of this project; however, it is still too early to tell if it is worthwhile.

 The findings are more discouraging when other aspects are factored into the equation, though. One of these is the degree to which lucidity was achieved. There are no direct measures of this but the length of lucidity can be a clue and the lucidity experienced during this project lasted only moments. When compared to other lucid dreams I have had in the past, this is quite short. Details and colors were not as vivid as other lucid dreams either, indicating a lower degree of dream lucidity. Overall, it is my opinion that the degree of lucidity achieved during this project was low to moderate at best: a feature that should be taken into account when testing the efficacy of induction techniques.

 Another aspect that puts the results of this project into perspective is my personal record of achieving lucid dreams. The most lucid dreams I have experienced within a 2-week timeframe is eight, and six of these were WILDs. The induction technique used during this period consisted of taking health supplements at certain times and the results were astounding (Appendix B). It produced five WILDs within 6 days, which is by far the most I have experienced in such a short window of time. Utilizing specific sleeping positions worked well as an induction technique, too, producing five lucid dreams within 2 weeks, three of which were WILDs. Sitting up and sleeping-lion were the two sleeping postures employed during this time, but this method proved to be exhausting and, therefore, not applicable for the long term. Comparatively, the approach used in this project was just as tiresome if not more so than the sleeping positions, and it still did not perform as well. As Figure 3 demonstrates, some sort of strategy is necessary to experience lucid dreaming, as the 2 weeks prior this project contained no techniques and no lucidity. I would add that I do not feel proficient at lucid dreaming because I am still in the experimental phase of figuring out which induction techniques work best for me, which may affect results.

**Fig. 3.** Comparison of personal two-week trials using different induction techniques

**Limitations**

Given the single participant case study design, there are many inherent limitations to this study. The biggest of these is not being able to generalize the findings to other populations because the intervention might not produce the same outcomes (Yin, 2014). This reduces the external validity of the study so actions were taken to increase this particular aspect. The timing of 14 consecutive days was one of these actions, bringing the study closer to a real-world scenario as dream lucidity seems to be difficult to induce repeatedly in succession (Stumbrys et al., 2012). Generalizability was also strengthened by choosing to conduct the study at the participant’s place of residence as opposed to a sleep lab. Several population characteristics were given in attempts to increase the external validity as well (Yin, 2014). These included: handedness, sex, age, dream recall, prior lucid dreaming experience, culture, attitude towards dreams, personality, sleep schedule, hobbies, and substance ingestion. With all these added measures, the external validity is still poor, especially because the method of data collection was researcher-as-participant observation.

Researcher-as-participant observation is probably the largest limitation of this project due to the biases built-in to subjective involvement. Possible data manipulation is clearly the most prevalent of these biases (Yin, 2014) so an independent judge was added to the procedure as way to help counteract this partiality. This does not eliminate the issue but, given the fact the results were not extraordinary either (see Figure 3), it adds to the confidence that tampering with data was not a major issue for this case study. There were two reasons for choosing this form of data collection: the highly subjective nature of the phenomenon in question, and, to test a new intervention using a pilot study context before moving on to larger sample sizes. Unfortunately, not much more could have been done to improve the external validity of this study but it can be strengthened through replication in future studies with more representative samples. Although, as mentioned earlier, the data collected in this project was comparable to the data collected in a larger group study. (Voss et al., 2013).

Internal validity was not much of a concern for this project but there are a few points that should be brought up regarding its strength. In observational research such as this, the internal validity “may be compromised by not having a control group or by having a control group that is not comparable to the exposed group in measurable or unmeasurable ways” (Carlson & Morrison, 2009, p. 81). While there was no control group designated for study, there was a quasi-control time period of 2 weeks prior to the intervention during which no efforts were made to have a lucid dream. And, indeed, no lucid dreaming took place. Investigator bias could be claimed to account for the results (Yin, 2014) but the difficulty of inducing a lucid dream rules out most other causes that may have led to the findings instead of the intervention, too. Also, the monitoring of possible confounding variables and revealing many population characteristics increased the internal validity of this project just as it did the external validity.

Construct validity is typically a problem for research into the phenomenon of dream lucidity because the participants can be confused and varied in opinion as to what exactly entails a lucid dream (Barrett, 1992). For this study, it is unlikely that the participant misunderstood the definition of a lucid dream since he had prior experience with the phenomenon. It is also unlikely because a strategy of data triangulation was used to ensure strong construct validity. This strategy included using multiple sources of evidence, the dream journal and LuCiD scale, in addition to “having a key informant review the draft case study report” (Yin, 2014, p. 45). Given these safeguards, construct validity is probably not an issue for this study.

Questionable test-retest reliability is a valid concern for the LuCiD scale of this study since the instrument came out in 2013, only one year before this study, and has received no external substantiation. However, most of the subscales demonstrated good reliability in the initial study (Voss et al., 2013) so it can be assumed that this would stay relatively the same for this study. Motivation might be the biggest threat to the reliability of this project because the participant was not always enthusiastic about performing the intricacies of the intervention. Future studies should consider monitoring this aspect since it is reported as being critical to experiencing the phenomenon (LaBerge & Rheingold, 1990).

Adherence to protocol is also another possible limitation of this project. Although this is doubtful since this researcher as the participant read about them extensively and has had some experience with each one of them individually prior to the project. Only one session of mindfulness meditation was missed, but there was trouble following through with the hypnagogic transition technique because of falling unconscious shortly after beginning its use. At least 10 reality-checks were ensured each day by setting 10 alarms on a cell phone, and the times were randomly generated using a tool online. The highest number of reality-checks performed in a day was 17 with an average of 13.6. Since the researcher-as-participant awoke in the same position throughout this study with the exception of hand placement, adherence to the sleeping-lion posture technique was not an issue. Neither was the WBTB technique with the assistance of alarms and timers. One final limitation of this project that should be stated is its design. Since it was not a randomly selected, double-blind experiment, findings can only demonstrate a correlation between the two variables and cannot offer evidence of causation (Yin, 2014).

**Future Directions**

Overall, this combination of induction techniques did not do as well as personal trials of other induction techniques, especially for attaining WILDs. Supplements seemed to be the best in this regard, and I believe a key difference between the two is the idea of rest. When I used supplements, I attempted a lucid dream every other night and did not accompany it with any other induction techniques. This means that little time was spent trying to induce a lucid dream, as opposed to this combination technique, which required roughly 3 hours of effort every day. After a while, I found this intensive routine to be exhausting, which negatively affected my motivation for becoming lucid in a dream. This idea of rest should be considered when testing induction techniques because *adequate motivation* is so central to having the lucid dreaming experience, as established by many researchers (LaBerge & Rheingold, 1990; Synder & Gackenbach, 1988; Wallace, 2012). Talking about WILDs, LaBerge and DeGarcia (2000) commented that, “this form of lucid dream initiation is a skill that improves with motivation and practice” (p. 281) so a longer time frame with more rest would probably be beneficial in determining efficacy of induction techniques. WILDs appear to occur more often in a laboratory setting than a home setting (LaBerge & Rheingold, 1990) so this should be considered as well when testing techniques aimed at this form of induction.

The combination technique tested in this project did not show a drastic increase in lucid dreaming, but it did show improvement. Perhaps with more time and more rest, it would produce better results. I believe the hypnagogic hallucination method warrants further investigation as well because, in my opinion, I did not implement it to the best of what it offers. This initial phase of determining the most effective WILD induction techniques will be more difficult than DILDs, but it will be better in the long run because WILDs are much more conducive to scientific scrutiny. The conduciveness of them is derived primarily from the characteristic that they seldom happen unexpectedly, meaning that researchers would no longer need to wait for a spontaneous DILD to occur but can deliberately plan the timing of a lucid dream investigation. The outcome of this would likely be more studies involving the topic, leading to more knowledge about it developing at a quicker pace. And since lucid dreaming appears to have a wide range of benefits, this is a good thing for both science and humanity.

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**Appendix A**

**The LuCiD Scale**

0 = strongly disagree, 5 = strongly agree

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | While dreaming, I was aware of the fact that the things I was experiencing in the dream state were not real. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. | While dreaming, I was able to remember my intention to do certain things in the dream. | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. | While dreaming, I was aware that the self I experience in my dream wasn’t the same as my waking self. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. | In my dream, I was able to manipulate or control other dream characters in a way that would be impossible in waking. | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. | While dreaming, I thought about other dream characters. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. | While dreaming, I was able to successfully perform supernatural actions (like flying or passing through walls). | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. | The emotions I experienced in my dream were exactly the same as those I would experience in such a situation during wakefulness. | 0 | 1 | 2 | 3 | 4 | 5 |
| 8. | While dreaming, I was aware of the fact that the body I experience in the dream did not correspond to my real sleeping body. | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. | I was very certain that the things I was experiencing in my dream wouldn’t have any consequences on the real world. | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. | While dreaming, I was able to successfully control or change the dream environment in a way that would be impossible during wakefulness. | 0 | 1 | 2 | 3 | 4 | 5 |
| 11. | While dreaming, I saw myself from the outside. | 0 | 1 | 2 | 3 | 4 | 5 |
| 12. | While dreaming, I thought about my own actions. | 0 | 1 | 2 | 3 | 4 | 5 |
| 13. | While dreaming, I had the feeling that I had forgotten something important. | 0 | 1 | 2 | 3 | 4 | 5 |
| 14. | While dreaming, I was able to change or move objects (not persons) in a way that would impossible in waking. | 0 | 1 | 2 | 3 | 4 | 5 |
| 15. | While dreaming, I was not myself but a completely different person. | 0 | 1 | 2 | 3 | 4 | 5 |
| 16. | While dreaming, I often asked myself whether I was dreaming. | 0 | 1 | 2 | 3 | 4 | 5 |
| 17.  | The thoughts I had in my dream were exactly the same as I would have in a similar situation during wakefulness. | 0 | 1 | 2 | 3 | 4 | 5 |
| 18. | While dreaming, I had the feeling that I could remember my waking life. | 0 | 1 | 2 | 3 | 4 | 5 |
| 19. | While dreaming, I was aware of the fact that other dream characters in my dream were not real. | 0 | 1 | 2 | 3 | 4 | 5 |
| 20. | Most things that happened in my dream could have also happened during wakefulness. | 0 | 1 | 2 | 3 | 4 | 5 |
| 21. | I watched the dream from the outside, as if on a screen. | 0 | 1 | 2 | 3 | 4 | 5 |
| 22. | While dreaming, I often thought about the things I was experiencing. | 0 | 1 | 2 | 3 | 4 | 5 |
| 23. | I was able to influence the story line of my dreams at will/at libitum. | 0 | 1 | 2 | 3 | 4 | 5 |
| 24. | While dreaming, I was able to remember certain plans for the future. | 0 | 1 | 2 | 3 | 4 | 5 |
| 25. | While dreaming, I felt euphoric/upbeat. | 0 | 1 | 2 | 3 | 4 | 5 |
| 26. | While dreaming, I had strong negative feelings. | 0 | 1 | 2 | 3 | 4 | 5 |
| 27. | While dreaming, I had strong positive feelings. | 0 | 1 | 2 | 3 | 4 | 5 |
| 28. | While dreaming, I felt very anxious. | 0 | 1 | 2 | 3 | 4 | 5 |

**Appendix B**

**Personal Lucid Dream Data**

|  |  |  |
| --- | --- | --- |
| Date | Type | Supplements |
| 12/25/10 | DILD |  |
| 08/31/11 | DILD |  |
| 10/14/11 | DILD |  |
| 11/25/11 | DILD |  |
| 12/06/11 | DILD |   |
| 12/19/11 | DILD |  |
| 09/24/12 | DILD |  |
| 10/20/12 | DILD |  |
| 10/28/12 | WILD | 4mg galantamine, 100mg choline |
| 11/01/12 | DILD |  |
| 03/24/13 | DILD |  |
| 07/25/13 | WILD | 8mg galantamine, 100mg choline |
| 08/01/13 | WILD | 8mg galantamine, 100mg choline |
| 08/17/13 | DILD | 8mg galantamine, 100mg choline |
| 08/27/13 | DILD |  |
| 09/08/13 | DILD | 8mg galantamine, 100mg choline |
| 09/22/13 | WILD | 4mg galantamine, 100mg choline |
| 09/29/13 | DILD | 4mg galantamine, 100mg choline |
| 10/07/13 | WILD | 4mg galantamine, 100mg choline |
| 12/21/13 | WILD | 4mg galantamine, 100mg choline, 50mg EGCg |
| 01/05/14 | WILD | 4mg galantamine, 100mg choline, 300mg alpha GPC |
| 01/07/14 | DILD | 3000mg l-glutamate, 1500mg 1-aspartic acid, 200mg l-theanine |
| 01/12/14 | DILD | 4mg galantamine, 100mg choline, 300mg alpha GPC |
| 01/12/14 | WILD | 4mg galantamine, 100mg choline, 300mg alpha GPC |
| 01/14/14 | WILD | 4mg galantamine, 100mg choline, 300mg alpha GPC |
| 01/14/14 | WILD | 4mg galantamine, 100mg choline, 300mg alpha GPC |
| 01/18/14 | WILD | 4mg galantamine, 100mg choline, 300mg alpha GPC |
| 01/18/14 | WILD | 4mg galantamine, 100mg choline, 300mg alpha GPC |
| 01/22/14 | DILD | 8mg galantamine, 200mg choline, 300mg alpha GPC, 60mg l-dopa |
| 01/24/14 | WILD |  |
| 02/03/14 | DILD |  |
| 02/06/14 | DILD |  |
| 02/09/14 | DILD |  |
| 02/14/14 | DILD |  |
| 02/14/14 | WILD |  |
| 02/14/14 | WILD |  |
| 02/19/14 | WILD |  |
| 02/26/14 | DILD |  |
| 03/15/14 | DILD | 4mg galantamine, 100mg choline, 300mg alpha GPC |