Lucid Dreaming and Utilizing Lucid Dreaming as a Therapeutic Tool

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I hereby certify that all material in this final year project which is not my own work has been identified and that no work is included for which a degree has already been conferred on me.

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Abstract

Lucid Dreaming (LD) is defined as the phenomenon of becoming consciously aware of dreaming while still dreaming. In sleep laboratory experiments LD has been verified to occur during REM sleep stage by proficient lucid dreamers who have signaled while becoming lucid through specific pre-determined eye-movements. Using this method, (lucid) dreamed activity has been shown to correlate with both psychophysiological and neurophysiological responses to those observable if the same activity was to be performed during wakefulness. LD has also shown potential to be of therapeutic value, in reducing recurrent nightmare frequency. Recurrent nightmare sufferers engaging in Lucid Dreaming Treatment (LDT) show reduced nightmare frequency after treatment. As such, LDT has been suggested to be effective in the treatment of posttraumatic nightmares in Posttraumatic Stress Disorder (PTSD). The attitude and feeling of control provided by LDT has been shown to be fruitful also in fearful waking situations, indicating that LDT might be effective in disorders epitomized by fear.

Keywords: Lucid dreaming, Lucid dreaming treatment, Nightmares, Posttraumatic Stress Disorder, Fear, Control
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1. Introduction

Lucid Dreaming (LD) is defined as the phenomenon of becoming consciously aware of dreaming – while still dreaming. Whilst lucid, the dreamer is fully aware of being asleep and that the experienced surrounding environment and events are but a dream. Following lucidity, the abilities to remember waking circumstances and identity, to reflect upon and alter the events of the dream and to act by free volition are regained in sleep (LaBerge, 1985). LD is a quite rare phenomenon and has been estimated that about 58% experience one lucid dream during their lifespan and 21% once or more a month (Snyder & Gackenbach, 1988). However, lucidity is a learnable skill and can be trained by engaging in different LD induction techniques (LaBerge, 1980; Purcell, Mullington, Moffit, Hoffman, & Pigeau, 1986).

The purpose of this essay is to shed light on the phenomenon of Lucid dreaming (LD) by presenting research findings on the psychophysiological and neurophysiological correlates of LD. The main issue of this essay is to focus on Lucid Dreaming Treatment (LDT): the potential utilization of LD as a therapeutic tool or supplement for treating recurrent nightmares, in alleviating the frequency of nightmares and the intensity of fear and anxiety in nightmare content. Further, this essay will attempt to theoretically explore and discuss the boundaries of LDT: First, by considering its effectiveness on Posttraumatic Stress Disorder (PTSD) in which nightmares are a diagnostic symptom and second, on phobia, characterized by feelings of fear and anxiety in the presence of specific stimuli, but not necessarily by nightmares.
2. Lucid Dreaming: Consciousness during Sleep

In the fourth century B.C, in the times of the ancient Greeks, the great philosopher Aristotle described that sometimes, when we are asleep, something within our consciousness asserts that the reality which we are experiencing is but a dream (Aristotle, 1952). In 1913 our ordinary view of dreams as irrational and uncontrollable contents of consciousness was again challenged when Frederick van Eeden set out to categorize different types of dreams. He described, in the same manner as Aristotle, a dream in which he realized that he was dreaming while still dreaming. He was suddenly able to reflect upon the content of the dream and had access to his waking memories and identity. Through this awareness he was able to consciously attend to, and alter, different aspects of the dream, all while still lying in bed, soundly asleep and dreaming - and so he coined the term Lucid Dreaming (Van Eeden, 1913).

It is crucial to point out that at the time van Eeden described LD, dreams were considered to be something we could neither control nor reflect upon while still dreaming. The nocturnal world of dreams has mesmerized mankind for ages and the theories on the nature of dreams are numerous. Although the perspectives on what is the true purpose of dreams vary, dreams have often been characterized by lack of self awareness, rational reasoning, free volition and loss of memory and believed to differ from waking thinking in the sense that the reflective and analytical way of thinking we engage in during wakefulness is missing (Green & McCreery, 1994; Hobson, 2002). Although, however, not all agree with this view today (for review, see Kahan, 2001). Nevertheless, from this perspective, LD was outside the conceptual boundaries of the nature of dreams and therefore met a lot of scientific critique: some suggested it to be only a state in between asleep and awake, the experience of being aware of having a dream following from a brief arousal (Hartmann, 1975), some simply stated that LD in itself was absurd and that no such phenomenon could exist (Malcolm, 1959).
These statements, however, encouraged scientists to challenge them, and so the quest for scientifically based evidence on LD began. Especially two researchers, working independently unaware of each other’s research, namely Keith Hearne and Stephen LaBerge, began to theorize and explore how LD could be scientifically validated as a phenomenon occurring during sleep.

2.1. Verification through Eye-signaling

Dreams mostly, but not exclusively, occur during the Rapid Eye Movement (REM) sleep stage, but as we reach REM sleep our muscle activity is inhibited, restraining us from acting out our dreams (Hobson, 1988). So how could the dreamer be able to signal to the outside, awake, world that he/she is currently having a lucid dream? Characteristic to REM sleep, as its name reveals, is that our eyes move back and forward in rapid speed outside of voluntary control (Hobson, 2002). As lucid dreamers have access to their waking memories during their lucid dream, it was theorized that the dreamer could remember a predetermined procedure of specific eye movements and through voluntary and controlled eye movements could signal when becoming lucid in REM sleep stage.

The first published article verifying that LD do occur during (REM) sleep (LaBerge, Nagel, Dement, & Zarcone, 1981), was first refuted (LaBerge, 1985), apparently the skeptics were not ready to redefine their concept of ‘dreaming’, and the article was not published until one year later. In his study, LaBerge et al. (1981) gave the participants the prearranged task to perform specific eye movements, also in combination with specific hand clenching procedure when realizing they were dreaming, afterwards showing that eye signaling alone was the most effective signal. Standard polysomnogram were recorded, i.e., electroencephalogram (EEG), electro-oculogram (EOG), electromyogram (EMG), and EMG for left and right wrist. The participants, fully conscious and aware of being asleep, were able to remember and execute their prearranged tasks by free volition. Through this they
communicated from inside the dream world to the outside, awake, world that they were lucid. This way, LaBerge et al. (1981) and also Keith Hearne (1978), recognized the phenomenon of LD to occur during (REM) sleep, to be a state in which the dreamer becomes fully conscious of being asleep, and proved the critique to be wrong. Suddenly an opportunity emerged to do what no one believed could be done, namely enter the world of dreaming fully conscious, and to explore the depths of human dreaming, sleep and consciousness.

2.2. *Psychophysiological Correlates of LD*

Studying the psychophysiological correlates of dreaming has been somewhat problematic due to the difficulty in matching the subjective dream report with the measured physiological responses. However, as lucid dreamers can perform pre-arranged tasks and signal the performance, LD can cope with this problem. Since it was evident that the phenomenon of lucid dreaming does occur during (REM) sleep close correlations between dreamed activity and the equivalent effects that would be observed if the same activity was carried out during wakefulness have been discovered, by using the method of eye-signaling (LaBerge, 1988, 1990).

In order to investigate the question of how time is perceived in dreams, lucid dreamers were given the prearranged task of estimating ten second intervals in their dream by counting (LaBerge, 1985, 1990). They were to eye-signal the beginning and end of the counting, thus providing an objective report of their subjective experience during the dream. The study showed, in all cases, that the time estimates closely equaled the actual time it took for the participants to count to ten while awake (LaBerge).

In one case study LaBerge and colleagues (LaBerge, Greenleaf, & Kedzierski, 1983) examined to what extend dreamed sexual activity was reflected in physiological measures by recording EEG, EMG, EOG, skin conductance level (SCL), respiration rate,
heart rate, vaginal EMG (VEMG) and vaginal pulse amplitude (VPA) while the participant lucidly engaged in sexual activity. The participant was to signal when becoming lucid, when beginning the sexual activity and when experiencing orgasm, and was able to carry out the tasks according to the instructions. The results from the study showed correlations between the dreamed sexual activity and what would be expected if comparable sexual activity would have been experienced under waking circumstances. The findings showed increased activity in VEMG, VPA, SCL and respiration rate, with the exception of heart rate which increased only slightly. Yet, another study (Erlacher & Schredl, 2008a) showed that engaging in physical activity, in this case squats, during LD correlated with increased heart rate.

Another study showed that dreamed patterns of respiration are closely paralleled to the patterns of waking respiration (LaBerge & Dement, 1982a). Lucid dreamers were to voluntarily control their respiration by either holding their breath or breathing rapidly, and mark these tasks by eye-signaling. As hypothesized, the results correlated with actual respiration patterns to the degree that an independent researcher was able to tell apart which of the two breathing tasks had been performed, simply on the basis of the respiration rate recordings (LaBerge & Dement).

2.3. Neurophysiological Correlates of LD

In terms of the neurophysiological correlates of (lucid) dreaming, research studies have been supportive of the idea that dreamed actions share, to some extent, the same neural substrate as during waking performance (Erlacher & Schredl, 2008b). LaBerge et al. (1981) found that hand clenching during LD resulted in twitches, observable in the EMG, of both left and right forearm. Following this finding, Erlacher, Schredl and LaBerge (2003) hypothesized that dreamed movements (hand clenching) require the same neural correlates as hand clenching during waking conditions. During their case study, the participant was to perform hand clenching and, as the control condition, counting while lucid, and to verify the
performance through eye movements. The results showed that during hand clenching EEG alpha power over bilateral motor areas decreased while this did not occur during counting, in support of their hypothesis. Alpha activity generally represents that the brain is in a resting state, and so decreased alpha activity indicates increased activity (LaBerge, 1985).

In a study investigating how singing and counting during LD correlates with actual singing and counting, it was predicted that while singing the right hemisphere was to be more active and so the left hemisphere, less active in this case, ought to show increased alpha activity. The participants were to signal with specific eye-movements the initiation of singing and also before starting to count. The results showed, as predicted, that dreamed singing correlated with increased right hemispheric activity and that this shifted to the left hemisphere during dreamed counting, following the same patterns as engaging in these activities during wakefulness (LaBerge & Dement, 1982b).

Thus far, research has shown how different voluntary actions during LD share, to some extent, the same psychophysiological and neural correlates. Up until only recently no results have been presented concerning the neural correlates of the nature of LD. What clearly separates LD from ordinary dream experience is the occurrence of full self-awareness, free volition and logical reasoning while dreaming. The diminished self-awareness, loss or reduction of reflective thinking and voluntary control during dreaming have been suggested to be due to the deactivation of parts of the prefrontal areas of the brain, in particular the dorsolateral prefrontal cortex (DLPFC). The prefrontal cortex and DLPFC are associated with executive functioning, i.e., planning, decision making and logical reasoning (Muzur, Pace-Schott, & Hobson, 2002; Voss, Holzmann, Tuin, & Hobson, 2009). Derived from the hypothesis that LD ought to involve the reactivation of the DLPFC to allow experience of reflectivity and control, recently published results indicated increased frontal activation during LD when compared to normal REM sleep. However, it is unclear whether or not LD
was compared to normal dreaming during REM sleep (Voss et al.). In another study, an EEG comparison between lucid and ordinary dreams, the results significantly indicated a tendency for increased activity in the left parietal lobe, an area associated with self-awareness and semantic understanding, during LD (Holzinger, LaBerge, & Levitan, 2006).

As EEG measures do not provide any detailed localization of neural activity, neither of the results reveal whether or not specifically DLPFC is reactivated. Voss et al., (2009) suggest for future research to use the method of Positron Emission Tomography (PET) in order to obtain more detailed results regarding the neural correlates of LD. In addition to the preliminary data on what cortical areas might be involved in LD, Voss et al. also showed that LD differs both from wakefulness and ordinary dreams, in that LD is a state of consciousness on the borderline in between awake and asleep, involving features characteristic to both. Hobson (2009) thus suggests LD to constitute a third state of consciousness which can provide revolutionary findings and cause major changes in both consciousness studies and psychology.

3. Lucid Dreaming Treatment

As LD offers the dreamer the possibility to consciously attend to the content of the dream and the possibility to alter it, many have suggested the potential utilization of LD as a treatment for recurring nightmares (Gackenbach & Bosveld, 1989; Gavie & Revonsuo, 2010; Green & McCreery, 1994; Halliday, 1988; LaBerge, 1985; LaBerge & Rheingold, 1990; Tholey, 1988). Lucid Dreaming Treatment (LDT) arose from this idea as an alternative cognitive-restructuring technique, but only a small amount of research has been conducted on the topic, composed mainly of case studies (Abramovitch, 1995; Brylowski, 1990; Spoormaker & van den Bout, 2006; Spoormaker, van den Bout, & Meijer, 2003; Zadra & Pihl, 1997). LDT has also been suggested to be effective in the treatment of posttraumatic
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nightmares (Gavie & Revonsuo; Green & McCreery) and that LD, in general, could provide the opportunity to practice activity which under waking circumstances is difficult or frightening, such as performing physical activity for disabled people and rehearsing a speech for those nervous of public speaking (Green & McCreery). However, no controlled studies have yet been conducted on these suggestions.

3.1. LDT for Recurrent Nightmares

Nightmares are defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) to be extremely frightening and anxiety provoking dreams which awakens the dreamer, followed by full alertness (American Psychiatric Association, 2000). Although this is the current definition used as a diagnostic criterion according to DSM-IV-TR, and in this essay, it should be mentioned that some have challenged this definition (Spoormaker, Schredl, & van den Bout, 2005; Zadra, Pilon, & Donderi, 2006). It has been suggested that there is more to the experience of nightmares other than the immense feeling of fear and the direct awakening. Other negative emotions such as grief and rage equally result in an unpleasant dream, just as fear, and have thus been considered to be taken into account in the definition of a nightmare. It has also been suggested that the nightmare is not compelled to awaken the dreamer, but that a bad dream from which the dreamer does not wake up can be equally distressing (Spoormaker et al.; Zadra et al.). However, it has also been shown that the differentiation between a nightmare, resulting in awakening, and a bad dream, which by definition does not awaken the dreamer, is important (Zadra & Donderi, 2000).

In the adult population as many as 70% of individuals may report at least an occasional nightmare and 2-5% suffer from recurrent nightmares (Lancee, Spoormaker, Krakow, & van den Bout, 2008). Suffering from recurrent nightmares causes distress in waking life and can result in both occupational and social dysfunction. The fear and anxiety which the nightmare provokes linger when the dreamer awakens from it, which may prevent
the individual from returning to sleep due to the fear of re-experiencing the nightmare. The awakenings may also, if frequent, increase the fear of the nightmare in such manner that the individual avoids going to sleep which in turn can lead to e. g., irritability and poor concentration that negatively affects daytime functioning (American Psychiatric Association, 2000).

It has been suggested that by becoming lucid during the nightmare, the dreamer can take control of the threatening situation and change the course of the nightmare, thus possibly alleviating feelings of fear and anxiety. This could possibly result in reduced nightmare frequency, relieving the nightmare sufferer from its negative effects both on sleep and waking life (Gackenbach & Bosveld, 1989; Gavie & Revonsuo, 2010; Green & McCreery, 1994; Halliday, 1988; LaBerge, 1985; LaBerge & Rheingold, 1990; Tholey, 1988). In LDT, the participants describe their nightmare and are then introduced to the concept of LD, the possibility to become conscious while dreaming and to be able to alter the content at will. The participants are then taught different LD induction techniques, such as choosing a recurrent cue within their dreams to be a signal of being in the dream state, or questioning the nature of reality several times during the day, asking themselves ‘Am I dreaming?’ The participants then choose an alternative, more positive scenario of the nightmare, focusing on the content they wish to alter whilst lucid (Spoormaker & van den Bout, 2006; Spoormaker et al., 2003; Zadra & Pihl, 1997).

The results of utilizing LD as treatment are consistent, indicating that LDT is effective for reducing nightmare frequency (Abramovitch, 1995; Brylowski, 1990; Spoormaker & van den Bout, 2006; Spoormaker et al., 2003; Zadra & Pihl, 1997). A one-year follow-up showed that four out of five participants, who prior to the treatment suffered from nightmares once every few days to once every few months, no longer had any nightmares (Zadra & Pihl). In another study the treatment consisted of one two-hour session either
individually, in group or, and as the control condition, being on a waiting list where no treatment was received. The participants had suffered from nightmares for over one year, at least once a week. The 12 week follow-up showed that nightmare frequency decreased in both treatment conditions, which was not the case for the control group (Spoormaker & van den Bout). For some LDT was also effective in reducing non-recurrent nightmares with differing contents (Zadra & Pihl). Some have also reported subjectively slightly improved sleep quality after LDT (Spoormaker et al.) and that dream lucidity gave rise to positive psychological elements which were reflected in waking life (Zadra & Pihl). Similar effects have been reported by Brylowski and Abramovitch.

Although nightmare frequency was reduced in these studies, not all of the participants were successful in becoming lucid and to lucidly alter the content of the dream. This has been theorized to be due to the mere feeling of control, necessary to LDT. Being able to master the nightmare and not being its victim seems to play an equally vital role as the actual altering of the content (Spoormaker & van den Bout, 2006; Spoormaker et al., 2003; Zadra & Pihl, 1997).

3.2. Nightmares in Posttraumatic Stress Disorder

Experiencing a traumatic event of extremely frightening and life-threatening character may, for some people, develop into Posttraumatic Stress Disorder (PTSD). PTSD is a severe anxiety disorder in which the symptoms are collected under three clusters: intrusive/re-experiencing symptoms, avoidance symptoms and hyper arousal symptoms. Suffering from PTSD involves e.g., intrusive recollections of the event, an extreme sensitivity towards both internal and external stimuli which resemble or symbolize some aspect of the original event and the persistent avoidance of all such stimuli, emotional numbness, sleep difficulties and the inability to remember some aspect of the event. As such, suffering from PTSD might cause conflicts within interpersonal relationships and
occupational situations due to the avoidance patterns and heightened sensitivity of the PTSD patient (American Psychiatric Association, 2000).

Posttraumatic nightmares are collected under intrusive/re-experiencing symptoms as they replay, or indirectly symbolize, the original traumatizing event (American Psychiatric Association, 2000). Posttraumatic nightmares also constitute the most frequent symptom in PTSD, as it has been estimated that up to 60-80% of PTSD patients suffer from them (Spoormaker, 2008). However, research has shown that treating PTSD does not necessarily reduce nightmare frequency (Spoormaker; Spoormaker & Montgomery, 2008). In contrast, Imagery Rehearsal Therapy (IRT), a treatment focusing on alleviating nightmare frequency in PTSD also reduces general PTSD symptom severity (Krakow & Moore, 2007). Research has also shown that nightmares and disturbed sleep may be a risk factor for developing and maintaining PTSD (Mellman & Hipolito, 2006). Due to these findings, Spoormaker (2008) and Spoormaker and Montgomery (2008) denote that posttraumatic nightmares ought not to be viewed as a secondary symptom but rather as a core feature in the progress of PTSD, which might develop into a disorder of its own and therefore demands specific treatment.

LDT is effective in reducing the frequency of recurrent nightmares (Abramovitch, 1995; Brylowski, 1990; Spoormaker & van den Bout, 2006; Spoormaker et al., 2003; Zadra & Pihl, 1997), and thus it has been suggested that LDT could be a valuable supplement in the treatment of PTSD, focusing on alleviating the posttraumatic nightmares. As posttraumatic nightmares are a nocturnal replay of the original traumatic event, the patient is reminded of the trauma every time they dream about it. In this sense the intrusive nightmares could increase the general level of fear and anxiety and in addition to this, as proposed by Spoormaker (2008) and Spoormaker and Montgomery (2008), posttraumatic nightmares might play a key role in prolonging and enhancing general PTSD symptom
severity. As such, LDT could work as a supplement to already existing treatment of PTSD and reduce nightmare frequency. Further, LDT offers the patient the opportunity to alter the content of the dream to a less fearsome dream, which possibly could lead to reducing also the feelings of fear and anxiety within the dream. If LDT is effective both in reducing nightmare frequency and the intense feelings of fear and anxiety, it might also be effective in decreasing the fear and anxiety associated with the original trauma during wakefulness, which in turn could lead to a reduction in general PTSD symptom severity.

Although the possible effectiveness of LDT on PTSD was proposed by Green and McCreery (1994) in the early days of LD research and also recently by Gavie and Revonsuo (2010), only in one study have researchers attempted to treat PTSD patients with LDT (Spoormaker & van den Bout, 2006). Nightmare frequency was significantly reduced in subjects receiving LDT, but the study did not reveal any significant reduction in general PTSD symptom severity, which the authors propose might have been due to the low baseline for PTSD symptom severity in the studied population. Moreover, the study included only one participant out of 23 who was actually diagnosed with PTSD (Spoormaker & van den Bout). Gavie and Revonsuo put forward that no conclusions can be made based on this single study and encourage future research to investigate the effect of LDT on PTSD nightmares and other PTSD symptoms with larger groups of diagnosed PTSD patients and longer lucidity interventions.

4. Fear and Control: Two Key Components for LDT

Fear is a main component of nightmares, both experienced during sleep in relation to the nightmare content, and during wakefulness, as suffering from recurrent nightmares can lead to fear of going to sleep due to the risk of re-experiencing the nightmare. Fear also represents one of the most essential emotions during the course of PTSD (American
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Psychiatric Association, 2000). In PTSD, fear is not only related to the extreme fright which was experienced during the occurrence of the traumatizing event, but also refers to the massive feeling of fear evoked when the patient encounters associable stimuli, reminders of the original event. Posttraumatic nightmares generally replicate the original event, and as such the patient relives the trauma, and its accompanied fear, every time the nightmare occurs (Gavie & Revonsuo, 2010).

Although LDT has been shown to be effective in reducing recurrent nightmares, not all participants succeeded in becoming lucid and lucidly alter the content of the nightmare. This has been suggested do be due to that the feeling of control, following from the mere knowledge of the possibility to master the nightmare, is equally important as the actual altering of the content (Spoormaker & van den Bout, 2006; Spoormaker et al., 2003; Zadra & Pihl, 1997). As such, control might constitute a key component of LDT, both in respect to lucidly control the content of the nightmare and alter the course of the dream, but also to the mere feeling of control that the fear both during the dream and during wakefulness is something that can be overcome. In this sense, LDT might prove to be effective not only for patients suffering from nightmares, in reducing nightmare frequency, but also for patients suffering from disorders characterized by fear by offering the possibility to control the fear which possibly could reduce the level of the fear.

4.1. The Case of Borderline Personality Disorder, Depression and Nightmares

In one case study, a 35-year-old woman, diagnosed with Borderline Personality Disorder (BPD) and major depression, complained about frequent nightmares. She suffered from one to four nightmares per week, from which her self-confidence and security felt threatened. She did not suffer from recurrent nightmares, although her nightmares contained a recurrent theme, related to physical and mental abuse by her father as a child and husband as
an adult. Her nightmares were experienced so intensely that she had difficulties in separating them from reality and sometimes spoke of them as if they were real events (Brylowski, 1990).

The patient was introduced to the phenomenon of LD and instructed to keep a dream journal, which she was to take with her to therapy each week. She was also told to practice a LD induction technique every night, in order to learn how to become lucid during the dream. The appearance of either her father or husband was chosen as a ‘dream cue’, used as an indicator to remind her that she in fact is dreaming. When she recognized that she was dreaming she was also to use this realization as a reminder of that she was safely lying in bed and that there was nothing to fear (Brylowski, 1990).

During a six-month period, which included 24 sessions with her therapist, the patient experienced three lucid dreams and was able to alter the course of the nightmare in all three cases. Using LDT resulted in reduced nightmare frequency, intensity and distress. In addition to this, LDT provided her with a sense of mastery of her emotions and responses to nightmares which affected her in waking life as well, as she entered psychotherapy. In the dream state she had been able to take control of the situation and her therapist suggested that these abilities and attitudes could be used when dealing with similar problems in waking life. When she faced a stirred emotion or a difficult situation in waking life, she was now able to remind herself of how she had controlled a similar situation in the dream state and that she now had the capacity to deal with the waking situation, as while (lucid) dreaming (Brylowski, 1990).

Green and McCreery (1994) put forward that as LD provides with the experience of achieving control of one mental aspect (distressing nightmares), gaining control over one might have a generalized therapeutic effect. Brylowski (1990) shows in the case study how LDT not only reduced nightmare frequency and distress, but that engaging in LDT
extended into waking areas. LDT provided the patient with the experience of mastering a fearful situation within a nightmare, which prior to the treatment affected her to the degree that she could not differentiate the nightmares from waking events. After the treatment the patient expressed increased self-confidence, knowing that she now possessed the capacity to make changes in other, waking, circumstances as well.

Brylowski (1990, p. 82) put forward that: “.nightmares can occur across diagnostic syndromes.”. According to DSM-IV-TR, nightmares can occur frequently during the course of many psychological disorders without being a specific diagnostic symptom e. g., as a part of Personality Disorders, Anxiety Disorders, Mood Disorders and Schizophrenia (American Psychiatric Association, 2000). Brylowski concludes the importance of the lucid dream work for this patient as it also motivated her to start, and stay in, therapy, and suggest that LD as a therapeutic tool ought to be considered in the treatment of personality disorders and not only for treating nightmares.

Although diagnosed with BPD, the patient also show symptoms related to PTSD i. e., nightmares which direct or symbolically represents a traumatic event (history of abuse), and depression which, according to DSM-IV-TR, is highly associable with PTSD (American Psychiatric Association, 2000). On the basis of this, it is premature to draw any conclusions on the effect of LDT on personality disorders. However, engaging in LDT did have a general therapeutic effect in this case study, and as such LDT could be valuable as a supplement in the treatment of BPD and possibly other personality disorders. More studies are needed to investigate the possible general therapeutic value of gaining control over fear and anxiety in LDT, both in relation to recurrent nightmares and other psychological disorders, such as PTSD and personality disorders.
4.2 Exploring the Boundaries: Phobia

A disorder characterized by immense feelings of fear and anxiety is phobia. DSM-IV-TR describes three types of phobia: specific phobia, social phobia and agoraphobia. Whether suffering from an irrational and persistent fear of a specific object or situation (specific phobia), social situations in which the individual might be embarrassed and evaluated (social phobia) or open places difficult to escape from (agoraphobia), all of the three types of phobia are characterized by an unreasonable fear of a stimulus, causing anxiety and panic attacks. In order not to experience the extreme feeling of fear and anxiety, the patient frequently and intensely avoids the stimulus, which in turn negatively affects different aspect of daily functioning (American Psychiatric Association, 2000).

Following from that LDT aids the dreamer to control and cope with a fearful situation in the nightmare (Abramovitch, 1995; Brylowski, 1990; Spoormaker & van den Bout, 2006; Spoormaker, van den Bout, & Meijer, 2003; Zadra & Pihl, 1997) and that LDT has been shown to be fruitful in coping with fearful waking situations as well (Abramovitch; Brylowski), it is possible that LDT can be applied as a supplement in the treatment of phobias, focusing on providing the feeling of control. One study has shown that patients suffering from social phobia are less likely to believe in their own control over events and puts forward that this could bring about an unwillingness to and hesitation towards exposing themselves to frightening situations and take risks during treatment (Leung & Heimberg, 1996). This further underscores how essential the feeling of being in control is for the phobic patient. Incidentally, studies (Blagrove & Hartnell, 2000; Blagrove & Tucker, 1994) have shown that individuals who report LD are more likely than non-lucid dreamers to believe in their own control over waking life situations.

LDT shares an element with one the most effective treatments of phobia, namely exposure therapy (Spoormaker & van den Bout, 2006), which involves gradually exposing the
patient to frightening and anxiety provoking stimuli (Passer et al., 2009). Whilst lucid, the
dreamer can control the situation, knowing that it is ‘merely a dream’, thus being able to
willingly expose oneself to the phobia stimuli, for example, to practice a speech in front of a
crowd if suffering from social phobia. Sufferers of agoraphobia can practice being in open,
crowded places and patients diagnosed with specific phobia, e. g., fear of heights, could stand
on a mountain top. In this manner, the (lucid) dream could be used as a "practice court",
where the patient can be exposed to stimuli inducing phobia, but on ‘safer’ grounds. As such,
LDT could contribute with a feeling of control and of being able to master the fear which
could be valuable in waking therapy and situations when facing the stimulus of the phobia.

In addition to provide with a feeling of being able to control the fear of the
phobia, LDT can also include the actual experience of control, if lucidity is reached. In this
respect, LDT can provide an experience where the immense amount of fear and the following
anxiety attack is mastered. When confronting the phobia in waking life, the patient could be
equipped with an experience where the fear was under control, which possibly could aid the
patient during waking confrontation and therapy.

5. Discussion

The studies investigating the potential therapeutic value of LD in reducing
recurrent nightmares have shown promising results, where engaging in Lucid Dreaming
Treatment (LDT) has resulted in decreased nightmare frequency (Abramovitch, 1995;
Brylowski, 1990; Spoormaker & van den Bout, 2006; Spoormaker et al., 2003; Zadra & Pihl,
1997), slightly increased subjective sleep quality (Spoormaker et al.) and reduced nightmare
intensity and distress (Brylowski). As such, it has been suggested here, and elsewhere (Gavie
& Revonsuo, 2010; Green & McCreery, 1994) that LDT might be effective in reducing
posttraumatic nightmares in PTSD. Every time the nightmare occurs, the patient will re-
experience the trauma and the extreme fear associated with it, thus could the relief of the posttraumatic nightmare also reduce general PTSD symptom severity (Gavie & Revonsuo). With larger groups of diagnosed PTSD patients and longer lucidity interventions, future research could study the effect of LDT on posttraumatic nightmares.

One case study showed that the attitudes and skills learned with LDT can be transferred into waking life situations (Brylowski, 1990). This could be an indication of that LDT possibly works beyond the more concrete focus on alleviating nightmares. Although nightmare frequency was reduced, not all of the patients were able to reach lucidity and alter the nightmare script (Spoormaker & van den Bout, 2006; Spoormaker et al., 2003; Zadra & Pihl, 1997). On the basis of this, one possible key component of LDT could be that of control. Phobic patients have shown to be less likely to believe in their own control over events (Leung & Heimberg, 1996). As lucid dreamers tend to believe in their own control over waking situations to a higher degree than non-lucid dreamers (Blagrove & Hartnell, 2000; Blagrove & Tucker, 1994), and as control might constitute one of the key elements of LDT, LDT could be a valuable supplement in the treatment of phobia.

Further research is needed in order to investigate more deeply the underlying mechanisms of LDT, by comparing LDT to other cognitive-restructuring techniques, such as Imagery Rehearsal Therapy (IRT) and exposure therapy. In order to further explore the effect of LDT on recurrent nightmares and the potential utilization of LD as a therapeutic tool and supplement in the treatment of PTSD and phobia, larger groups of nightmare sufferers, diagnosed PTSD and phobic patients, longer LD induction technique practice and more intense lucidity interventions are needed, for LDT to be applicable in the appropriate patient population.
One problematic issue facing LDT, and LD research in general, is that proficient lucid dreamers are hard to find. Although LD is a learnable skill (LaBerge, 1980; Purcell et al., 1986), it is a rare phenomenon and it has been estimated that about 58% experience one lucid dream during their lifespan and 21% once or more a month (Snyder & Gackenbach, 1988). Several techniques to induce lucidity have been suggested, making it possible for people to control their LD frequency. Paul Tholey (1988) suggested questioning the nature of the reality, “Am I dreaming or not?”, several times during the day. This would increase the possibility of the same questioning during the dream, from which the dreamer would realize that the experienced reality is a dream and thus become lucid. Another method to induce lucidity is by giving external light cues (LaBerge & Levitan, 1995), but perhaps the most effective technique is Mnemonic Induction of Lucid Dreams (MILD) developed by Stephen LaBerge. MILD instructs the dreamer, upon awakening in the morning, to go through a dream several times. With the intention of remembering to realize being dreaming in the next dream, the dreamer will then visualize becoming lucid during the rehearsed dream when falling back to sleep (LaBerge, 1985).

Nightmares have been shown to induce unprompted lucidity (Green & McCreery, 1994; LaBerge, 1985). A significant correlation between LD and nightmare frequency has also been presented (Schredl & Erlacher, 2004), both have as well shown to correlate with personality traits such as ‘thin boundary’ and some of the ‘openness to experience’ facets, i.e., “feelings” and “fantasy” (Schredl & Erlacher; Pietrowsky & Köthe, 2003). Nightmare sufferers might as such have easier to induce lucidity than non-nightmare sufferers.

The Boundary Questionnaire was developed by Ernest Hartmann in order to measure differences in personality due to boundary structure: thin and thick boundaries in relation to internal and external circumstances. A thin boundary personality can be illustrated
as an individual who, e. g., have a tendency to lose her/himself in daydreaming and in relationships, who merge emotions and thoughts together, and whose personal space is less definite (Hartmann, Rosen, & Rand, 1998). Thin boundaries can be conceptualized as sub-dimensions of the openness to experience factor (Schredl & Erlacher, 2004; Schredl, Bocklage, Engelhardt, & Mingebach, 2008), as it resembles personality traits included in the openness to experience facet, such as imaginative and emotional. The openness to experience factor is one of the personality factors included in the Big Five personality factor model. The ‘Big Five’ model suggests that the basic structure of personality can be captured in five higher-ordered factors and is widely used in personality tests (Passer et al., 2009).

Although thin boundaries and openness to experience personality factors can be associated with LD (Schredl & Erlacher, 2004) and nightmares (Pietrowsky & Köthe, 2003; Schredl & Erlacher), as well as with coping strategies following a nightmare (Pietrowsky & Köthe), it has also been shown to correlate with general dream recall (Hartmann et al., 1998; Schredl & Wittmann, 2005; Schredl, Ciric, Götz, & Wittmann, 2003). General dream recall has also been shown to correlate with LD (Doll, Gittler, & Holzinger, 2009; Schredl & Erlacher) and nightmare frequency (Schredl & Erlacher). In one study, dream recall was partialled out in the statistical analysis. The results showed that the correlation between LD and nightmare frequency, as well as between LD and personality factors (thin boundaries and ‘openness to experience’), slightly decreased. However, they were still significant (Schredl & Erlacher). It is premature to conclude a correlation between LD and nightmares from these findings, and up to future research to investigate whether there is a personality and/or frequency correlation between nightmare sufferers and lucid dreamers. If there is, however, a correlation between nightmares and lucidity, nightmare sufferers might be more likely to achieve lucidity which would be helpful in LDT.
6. Conclusions
LDT has been proven to be efficient in the treatment of recurrent nightmares (Abramovitch, 1995; Brylowski, 1990; Spoormaker & van den Bout, 2006; Spoormaker et al., 2003; Zadra & Pihl, 1997). Case studies indicate that it may be useful in treating posttraumatic nightmares (Spoormaker & van den Bout) and nightmares related to other psychiatric disorders as well (Brylowski). In addition, LDT might prove to be effective not only for patients suffering from nightmares, in reducing nightmare frequency, but also for patients suffering from disorders characterized by fear by offering the possibility to control the fear which possibly could reduce the level of the fear. In this sense, patients suffering from phobias might benefit from LDT.

7. References


