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Bizarreness in Dreams and Nightmares

Richard A. Bonato

**A thesis submitted to the Faculty of Graduate Studies
and Research of Carleton University
in partial fulfillment of the requirements
for the degree of Master of Arts.**

Department of Psychology

**September 1990
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Ottawa, Ontario
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submitted by Rick Bonato, B.A.

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the degree of Master of Arts

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Abstract

The present study is an empirical criticism and evaluation of the cognitive concept of "bizarreness" in sleep mentation (i.e., the strange and unusual occurrences in dreams). There exist two perspectives towards bizarreness in dreams. One perspective holds that most dreams are bizarre whereas the other view holds that most are mundane. However, neither one of these perspectives have adequately considered the issue of bizarreness in nightmares. To fulfill a course requirement, 102 university students from a first year psychology course were asked to record one home-recalled dream and two home-recalled nightmares (one "typical" nightmare and one "worst" nightmare). These individuals reported a range of low to high dream recall, and low to high nightmare frequency. Only forty three of these individuals successfully recalled one dream and two nightmares. The 129 sleep mentation reports obtained from these individuals were content analyzed for bizarreness using the Carleton University Scale of Impossibility and Improbability (CUSII) and the Carleton University Global Realism Scale (CUGRS). A hypothesis that "worst" nightmares would possess the most

bizarreness was confirmed through the use of the CUGRS but was not confirmed with the CUSII. Contrary to expectation, there was more realism in nightmares than dreams. This is interpreted as indicating that the greater levels of bizarreness and realism found in nightmares is a reflection of greater report length as the differences between dreams and nightmares disappeared once dream length was held constant. Neither the traditional psychoanalytic view of dreams, nor the Activation Synthesis Hypothesis (ASH) are supported by these findings.

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General Introduction

Traditionally, dreams have been considered to be vivid and to be composed of strange or unusual characters, events, objects, thoughts or feelings. The term "bizarreness" has been used to categorize these peculiar cognitive features of dreaming, and some have suggested that bizarreness may distinguish dream consciousness from that of the waking state (Hobson, Hoffman, Helfand, & Kostner, 1987; Mamelak & Hobson, 1989). However, an entirely different perspective holds that most dreams are mundane rather than bizarre (Giora, 1981; Hunt, 1989; Hunt, Ogilvie, K. Belicki, D. Belicki, & Atalick, 1982). The defining of dreams as bizarre rather than mundane is a controversial issue fundamental to the study of sleep mentation, for it casts a shadow on the notion that waking and sleeping consciousness are similar, and instead suggests that the sleeping mind is radically different.

In light of this controversy, the purpose of the present study will be to critically analyze the concept of dream bizarreness, and to assess the degree of bizarreness in dreams and nightmares. While some investigators have examined bizarreness in dreams (Giora, 1981; Hobson et al., 1987; Hunt et al., 1982; McCarley & Hoffman,

1981; Porte & Hobson, 1986), only one other study has been located which has considered bizarreness in nightmares (Spadafora & Hunt, in press). As previous research has suggested a higher nightmare frequency for individuals with a history of sexual abuse (Cuddy, 1990) a second purpose of the study will be to compare both the dreams and nightmares collected from three groups of subjects. Specifically, the groups to be examined consist of individuals with a history of sexual abuse, a history of physical abuse, and individuals with neither a history of sexual nor physical abuse. Subjects will report one example of their worst nightmare, one example of their most recent or typical nightmare, and one example of their most recent or typical pleasant dream. In addition, this study will relate its findings to the currently popular Activation-Synthesis Hypothesis (ASH) (Hobson & McCarley, 1977; Hobson et al., 1987; Mamelak & Hobson, 1989).

The first topic reviewed in this paper will examine the theories that consider dreams to be bizarre. This will be followed by a review of the research literature which has found dreams to be mundane, and then by a critical analysis of the concept and definitions of bizarreness. Finally, the nightmare research will be

followed by a discussion of the possible relationship between sexual and physical abuse and nightmares. Before proceeding to the review of the literature the terms dreams, bizarreness, nightmares, sexual abuse, and physical abuse are defined.

Dreams have been defined as sequences of images or sensations, more or less structured, occurring spontaneously and with a sense of reality during sleep (Goldenson, 1984). Although most laymen equate the REM state as the only dream state (as well as some researchers), dreams have also been obtained in Non-REM (NREM) sleep (Foulkes, 1985; Foulkes & Vogel, 1965; Morel, 1990). As previously mentioned, the presence of improbable or impossible events, objects, characters, thoughts, and affect, has caused folk wisdom to hold that dreams are visually vivid and cognitively strange. A sudden shift in scenery from a city street to a northern lake is an example of bizarreness because of its discontinuity.

The Sleep Disorders Classification Committee of the Association for Sleep Disorders Center (1979) defined nightmares (also known as dream anxiety attacks) as "an awakening from REM sleep (sometimes light REM sleep) with unmistakable, detailed recall of an extended and disturbing dream, accompanied by anxiety

and some autonomic arousal" (p.105). While the nightmare is essentially an anxiety producing dream it has been distinguished from night terrors. A night terror, in contrast to the REM nightmare, usually occurs in NREM sleep stages 3 and 4 (Gastaut & Broughton, 1965) and is often accompanied by a scream, intense anxiety, and amnesia for the event (Anch, Browman, Mitler, Walsh, 1988; Hartmann, 1984). Research suggests that frequent and/or recurrent nightmares are often indicative of severe traumatic experiences such as combat, sea disasters, rape, and childhood sexual abuse (Ellenson, 1985; Esper, 1986; Hefez, Meiz, Lavie, 1987). According to Lindberg and Distad (1985) symptoms exhibited by 17 women sexually abused during childhood or adolescence appear to fit the features of a chronic and/or delayed post-traumatic stress disorder (PTSD). As both physical and sexual abuse will be an issue in this study, it is necessary to closely delineate the various forms each can take. For example, the literature identifies two distinct forms of sexual abuse. Russell (1983) defined extrafamilial child sexual abuse as the following:

one or more unwanted sexual experiences
with persons unrelated by blood or
marriage, ranging from petting (touching

of breasts or genitals or attempts at such touching) to rape, before the victim turned 14 years, and completed or attempted forcible rape experiences from the ages of 14 to 17 years (p. 135).

Intrafamilial child sexual abuse (incest) was considered to be "any kind of exploitive sexual contact that occurred between relatives, no matter how distant the relationship, before the victim turned 18 years old" (Russell, 1983, p.135). Sexual experiences that were wanted and were with a peer (an age difference of less than five years) were not considered to have been abusive. Although definitions of sexual abuse vary, most definitions involve the elements of exploitation and abuse of power, sexual contact, and an age difference of 5 years or greater. Physical abuse is also an abuse of power and has been defined by Wayne and Avery (1980, p.8) as "any nonaccidental physical injury inflicted on a child by a parent (or other caretaker) deliberately or in anger".

The preceding definitions will be used for the remainder of this paper and any deviations from them will be appropriately indicated. The definition of bizarreness is particularly crucial in the present study as it will examine how semantic variations will influence both the frequency and type of bizarreness. Having defined

the key terms it is now appropriate to examine some of the theories and research that have been used to explain and support the assumption that dreams are inherently bizarre.

SECTION 2.0 DREAMS AS BIZARRE

2.1 Psychoanalytic Theory and Bizarreness

In his paper, "On Dreams" Freud (1901) distinguished sensible and intelligible dreams from those which are disconnected, confused, and meaningless. He argued that we have numbers of sensible and intelligible dreams but that most dreams are confused and unintelligible. However, in The Interpretation of Dreams Freud (1900) offers an elaborated view on the nature of dreams. There he postulated that two distinct mental processes were operating during the production of the dream: the construction of the dream-thoughts, and their transformation by the dream-work through condensation, displacement, symbolic representation, and secondary revision into the dream-content. According to Freud (1900) "dreams, are often most profound when they seem most crazy (p.575)." He went on to state that...

...we should disregard the apparent coherence between a dream's constituents as an unessential illusion, and that we

should trace back the origin of each of its elements on its own account. A dream is a conglomerate which, for purposes of investigation, must be broken up once more into fragments (p.581-582).

The Interpretation of Dreams (Freud, 1900) abounds with such references to the nonsensical or absurd nature of dreams - as one might expect - for his theory could only account for bizarre mentation. Essentially, Freud's theory holds that day residues and unconscious wishes provide material for the dream-thoughts or latent dream. This material would then go through the process of the dream work where it would be condensed, displaced, symbolized and would undergo secondary elaboration. The bizarre aspects of dreams are introduced by the dream work to disguise unconscious wishes which are unacceptable to consciousness. The degree to which the unconscious wishes are disguised varies directly with the strictness of the censorship (i.e., the dream-censor). The resulting manifest dream, which is acceptable to consciousness, thus disguises the latent dream and prolongs sleep (Freud, 1900).

Thus, Freudian psychoanalytic theory would hold that all manifest dreams are qualitatively different from waking mentation. In his Outline of Psycho-Analysis (Freud, 1940) he reinforced the

notion that all dreams are bizarre by referring to a dream as a psychosis, with its attendant absurdities, delusions, and illusions. It is for this reason he adamantly advanced the use of free association as the sole method for interpreting the dream and thereby returning to the latent dream and inevitably to the dream-wish. Although Freud attempted to thoroughly uncover the mysteries of human dreaming, it must be acknowledged that several rudimentary faults remain with psychoanalytic dream theory.

Freud's perception that all dreams have a latent wish should be examined closely, as his interpretation completely ignores the common nightmare experience. For example, it would be extremely difficult to discover a latent wish from the nightmares of combat veterans or rape victims who often replay the traumatic events as nightmares during sleep (Burgess & Holmstrom, 1974). Moreover, his refusal to acknowledge the existence of mundane or logical dreams places the modern-day application of his theory in question. He considered logical dreams to be "fantasies" which actually occurred while the individual was awake (Freud, 1900); however, modern laboratory studies have obtained mundane dreams from REM sleep (E. Dorus, W. Dorus, & Rechtschaffen, 1971). Finally, it is within the

very framework of free association that one is inevitably led to the past and often to infantile wishes. Thus, any such findings should not be seen as explanations, but rather as theoretical and methodological shortcomings.

Despite the difficulties and overgeneralizations of Freudian psychoanalytic theory, its contribution to the study of dreams cannot be refuted as it brought the study of dreams to a greater level of general acceptance. The fact that his theory is still discussed in the current literature, nearly one century later, is a confirmation of that accomplishment. Furthermore, certain current theories contain some commonalities with Freud's concepts. One such theory is the popular Activation-Synthesis Hypothesis (ASH) which also considers dreams to be bizarre (Hobson & McCarley, 1977).

2.2 Activation-Synthesis Hypothesis

According to Hobson and McCarley (1977) the concept of mind-body isomorphism (similarity between psychological and physiological domains) can be used to explain dreaming. The ASH holds that many aspects of dreams, such as visual or affective intensity and bizarreness, are simply psychological concomitants of

the periodic and physiological activation of the brain during REM sleep. Specifically, the theory offers evidence for the mechanisms by which the brain is regularly activated during REM sleep and accounts for sensory and motor blockage despite high levels of brain activation.

Obviously, the essential component of the ASH is brain-mind activation during REM sleep to support dream mentation. This is achieved during sleep through the periodic cessation of inhibitory aminergic (REM-off) neurons (specifically norepinephrine and serotonin) and the activation of excitatory cholinergic (REM-on) neurons (Hobson & McCarley, 1977; Hobson, 1988). Thus, the trigger and clock for REM sleep (REM-off and REM-on neurons) are located within the brain stem, and are mediated by disinhibition and consequent random and sporadic excitation of neurons throughout the brain. While it is not yet known which of the two brain stem populations is the initiator, Hobson (1988) believes that the aminergic group is responsible because the reticular formation neurons (REM-on) are able to maintain activation throughout the brain once disinhibited. The size of the brain seems critical to determine the duration of REM sleep and dreaming, and it is proposed

that protein transport time is the basis of the relationship between brain size and REM period length (Hobson, 1988). Thus far it has been shown how, according to Hobson, the mind is activated during REM sleep but certain brain characteristics are necessary for dreaming to occur. These characteristics, which will be discussed next, include sensory-input blockage, the blockade of motor output, and the generation of internal stimuli.

Sensory-input blockage is one characteristic necessary for dream production. This is most likely caused by the excitatory reticular neurons which actively inhibit sensory nerves from conducting information into the central nervous system (Hobson, 1988). Another manner in which external sensory signals are excluded is competition, or occlusion, in which higher levels of sensory circuits in the mind are kept busy processing internally generated signals and consequently must ignore external signals (Hobson, 1988).

A second characteristic which is necessary is blockage of motor-output. Some of the reticular neurons are sending inhibitory commands to the motor neurons in the spinal cord while other neurons are sending excitatory commands to upper levels of the

motor system. The result is the generation of internal motor commands with external activation cancelled by inhibitory signals.

The final characteristic is internal signal generation which, according to the ASH, involves ponto-geniculo-occipital (PGO) waves. It is suggested (Hobson, 1988; Mamelak & Hobson, 1989) that PGO waves are automatic, internally generated information signals which originate in the brain stem and may mimic internal stimuli in the absence of external stimuli. Some PGO waves are sent from the brain stem to the thalamus and others are sent on independent pathways directly to both the visual and association cortex (Hobson, 1988; Mamelak & Hobson, 1989). These waves could serve as a source for bizarre dreams through a rapid and discontinuous jump from one set of neuronal responses into a second set of responses that are independent of the original response. It is at this point that the mind attempts to synthesize these random, sporadic neural discharges in terms of the information stored in memory (Hobson & McCarley, 1977; Hobson et al., 1987; Hobson, 1988; Mamelak & Hobson, 1989).

During sleep, the mind is activated and is receiving information stored in memory, but is unable to test both external

and internal realities. While unable to test reality multiple sensory channels are simultaneously activated - a kaleidoscopic barrage of internally generated information - and are synthesized into a single plot. The resulting dreams are very bizarre and may contain sudden jumps in time or location, fusions or impossible combinations of people, places, times and activities. Thus, through a process of periodic activation and an attempt to synthesize the random and sporadic brain stem discharges, bizarre dreams are produced. The conclusion that dreams are bizarre holds relevance for the meaning of dreams.

The ASH, in agreement with Freud's theory, holds that dreaming is a valid model of psychosis. It follows, therefore, that dreams are only as meaningful as is possible within a sporadic and chaotic mentation-generating system (Hobson, 1988). Unlike psychoanalytic theory, however, Hobson considers the meaning of dreams to be transparent and to be obtained directly rather than being opaque and requiring a model of interpretation. The concept of dream bizarreness is used by the ASH to belittle any meaning which may be ascribed to dream mentation.

In an effort to categorize the type and degree of bizarreness,

Hobson and his colleagues (Porte & Hobson, 1986; Hobson et al., 1987; Hobson, 1988; Mamelak & Hobson, 1989) have developed a two stage scoring system for dream bizarreness. Stage one establishes the dream domain or report locus of each bizarre item. Here items are considered bizarre if they are physically impossible or improbable. Impossibility and/or improbability are said to exist when the probability of occurrence is less than one in twenty (Porte & Hobson, 1986; Hobson et al., 1987; Hobson, 1988; Mamelak & Hobson, 1989). Ratings are conducted as follows: bizarre plots, characters, actions or objects are grouped under the label "A"; bizarre thoughts of the dreamer or dream character are labelled "B"; and the bizarre feeling state of the dreamer or dream character is categorized "C". Stage two establishes the character of each item of bizarreness.

Following the stage one rating (A, B, or C) items are placed under the following categories: category one is termed "discontinuity" - change of identity, time, place, or features; category two is labelled "incongruity" - mismatching features; category three is labelled "uncertainty" - explicit vagueness. For example, a change in plot from a movie theatre to a shopping mall

would be rated A1. Through the use of this two stage scoring system, research has examined the ASH in an effort to support the theory's notion on dream bizarreness. The prevalence and type of bizarreness found using this system will be reviewed next.

In a study examining bizarreness in REM and NREM sleep mentation, Porte and Hobson (1986) used the two stage scoring system and rated 110 paired sleep reports (36 eliminated from analyses) obtained from 73 subjects. Upon completion of scoring, a bizarreness density (number of bizarre items/report length) was calculated for each report to control for a correlation between sleep stage and report length (Hunt et al., 1982; McCarley & Hoffman, 1981). It was found that 70 percent of REM reports equalled or exceeded the predetermined 0.6 criterion, while this level was achieved in only 10 percent of the NREM reports. It is unfortunate that the authors did not report reliability figures or the number and type of bizarre items for REM/NREM mentation. The authors concluded that REM mentation is more bizarre than NREM mentation, and that this result supports the ASH of dream formation; however, the exact origin of the dreams used in this study is somewhat interesting.

Porte and Hobson (1986) express gratitude to Antrobus for "providing [them] with his large sample of REM-NREM reports" (p.81). Evidently, the authors obtained the set of 146 paired sleep reports (73 subjects) from Antrobus. Antrobus (1983) also reported the analysis of 73 REM/NREM paired sleep reports which were assembled from eight studies carried out in five different laboratories. Each subject (Antrobus, 1983) contributed only one pair; that is, 146 reports obtained from 73 subjects - exactly the same figure as reported by Porte and Hobson. As the data originated from the same source (i.e., Antrobus), it is possible that the only research which has examined REM and NREM mentation for differences in bizarreness may have analyzed the same data. Each study found that REM mentation was more bizarre than NREM mentation although Porte and Hobson reported a greater difference between REM and NREM mentation than Antrobus. A subsequent elaborated discussion will suggest that this was due to a difference in definitions of bizarreness. A final point is that Antrobus's data were obtained from eight different studies conducted in five different laboratories. Possible differences - although subtle - may have existed in data collection techniques used in the various labs, and

such differences may have affected the dreams collected.

In another attempt to use dream bizarreness to support the ASH, Hobson et al. (1987) scored 60 dreams obtained from a mail-ordered dream journal. Through the use of the two stage scoring system they claim to have consistently found bizarreness in the dreams considered (Hobson et al., 1987); however, they do not give an exact figure of bizarreness. Nevertheless, they do point out that one dream was scored in which "hardly a sentence does not contain a bizarre item". The most common category of bizarreness was A2 (incongruity of plot, character, object) at 44 percent, which was followed by B3 (cognitive uncertainty) at 29 percent. A strong correlation was found between dream length and number of bizarre items ($r=0.99$), and the authors reported an inter-judge reliability of 0.64 and a reliability of 0.90 on items scored as bizarre. While these findings have been interpreted as corroboration for the ASH, it should also be noted that some methodological problems remain.

For example, the means by which Hobson obtained his data and the data he has used demand closer scrutiny. Hobson responded to an advertisement for a dream manuscript in a medical catalogue which described a "manuscript...recording in copious detail...dreams

between July 15 and October 14, 1939. Illustrated and extremely well written. The manifest content is reported without interpretation." (Hobson, 1988, p.236). He purchased this dream journal and received, in the mail, "a bound laboratory record book of 150 lined pages, 100 of which contain meticulous descriptions - in 233 separate reports varying in length from 1 to 78 lines" (Hobson, 1988, p.237). He has since given the name "Engine Man" to the author of the dreams. He acknowledged that he was taking a risk as to the authentic origin of the dreams and stated that, in his opinion, the majority of dreams occurred during REM sleep because of the vividness of details. Thus, Hobson's (1988; Hobson et al., 1987) use of only one subject and his "unique" method of collecting data (Hobson, 1988; Hobson et al., 1987; Porte & Hobson, 1986) necessitates a cautious interpretation of his finding that bizarreness occurs in the majority of dreams, particularly in light of the fact that he does not report any concrete figures of the degree of bizarreness. Furthermore, if individual styles of dreaming exist then the use of a single subject is an inaccurate means of supporting the theory.

If, as according to Hunt (1989; Hunt et al., 1982), individuals

dream in particular idiosyncratic fashions, then the "Engine Man" has strictly "Engine Man" dreams which may not be entirely applicable to others. Hunt considers Freud's and Jung's unique style of dreaming to have influenced the creation of their distinct theories of dreams. Thus, Hobson's conclusion that all dreams are bizarre is theoretically inappropriate as the "Engine Man's" style of dreaming (i.e., bizarre) may have influenced his theory.

Another shortcoming with the ASH is that it does not account for problem-solving or creative dreams as discussed by Boss (1958). Kekule's benzene ring dream is a classic example of how certain dreams may contribute solutions not otherwise obtained, thus it would be difficult to explain such dreams in terms of sporadic and random neural brain stem discharges. Regardless of the deficiencies with the ASH, it currently remains a popular theory possibly because it has attempted to connect neurophysiology and cognitive psychology.

In addition to the previously mentioned studies, other research has also supported the traditional folklore assumption that dreams are bizarre. This research typically uses laboratory awakenings from REM sleep and then subsequently analyzes the REM mentation

for bizarreness.

2.3 Convergence of Folklore and Research

McCarley and Hoffman (1981) considered 104 REM dreams obtained from 14 individuals who spent 12 nights in the Cincinnati Sleep Laboratory and concluded that most dreams are bizarre. They found a concordance level of 90 percent for whether a bizarreness category (all types) was present or absent in a dream. The results indicated that 67.3 percent of dreams contained at least one (i.e., ≥ 1) element of bizarreness and interpreted this as indicating a high degree of dream bizarreness. Unfortunately, the authors do not indicate how many dreams only contained one item of bizarreness or evidenced none whatsoever (i.e., ≤ 1).

Strauch (1988) has supported the viewpoint that bizarreness occurs in most dreams. Specifically, in the analysis of 117 REM dreams from 13 subjects she found that 75 percent demonstrated some form of bizarreness (i.e., ≥ 1 item of bizarreness per dream). A random selection of 30 of these dreams indicated that the Phi coefficient for the inter-rater reliability ranged from 0.7 to 0.9. She also compared the level of bizarreness in 12 waking fantasies to that in 39 REM dreams obtained from six subjects during 12 nights.

She found that REM dreams were significantly more bizarre than waking fantasies. Overall, she concluded that bizarreness is a common feature of dreams, but that the degree is often only slight and varies between subjects. However, closer investigation reveals that Strauch's work is fraught with deficiencies.

Another interpretation of her data indicates that 64.1 percent of her sample of dreams contain no more than one occurrence of bizarreness (i.e., ≤ 1) while 25.6 percent had no evidence of bizarreness whatsoever. Accordingly, as Strauch (1988) suggested, it should be emphasized that only minimal levels of bizarreness are a common feature of dreams. Strauch's definition of bizarreness (see section 4.0) could also be considered a liability. She considered bizarreness in dream form, and deviations in grammatical and semantic structure that render a dream report incomprehensible or deformed to be an appropriate aspect of dream bizarreness. Neologisms, fragmented sentences, and illogical sections comprised 28.2 percent of all bizarreness. Conversely, one could argue that neologisms represent creativity in dreams, and that deviations in grammatical or semantic structure are simply the result of errors or problems in recall due to the abrupt change in psychophysiological

states. If one considers bizarreness in dream form as inappropriate then approximately one-fourth of dream bizarreness is eliminated. This raises the interesting question as to whether an appropriate analysis of dream bizarreness should solely consider dream content or should it also consider the form in which the dream is reported.

Strauch's examination of waking fantasies is also deficient and should not be compared to sleep mentation. Prior to sleep onset the six subjects were asked to report waking fantasies and were provided with a starting point on each night. Subjects were either told to "Imagine it is night and you are standing at a window," or to "Imagine you are standing on top of a mountain." One cannot compare fantasies obtained following these scenarios with REM dreams because the subjects were asked to intentionally construct fantasies. However, with the possible exception of lucid dreaming, most dreams are not an intentional occurrence. Dreams "happen" to people during sleep, they are not deliberately "made". Strauch's findings are completely opposite to those of Reinsel, Wollman, and Antrobus, (1986) who simply asked subjects to quietly lie down in a sound attenuated room. Indeed, Reinsel et al. found that waking thought is more bizarre than dreaming. Thus, Strauch's work

contains some inherent flaws which may have contributed to an artificially inflated prevalence of bizarreness.

A study conducted by Zepelin (1989) examined bizarreness in REM dream reports obtained from 58 men aged 27 - 64 years. The reports that consisted of isolated images or thought fragments were discarded, but when independent sequences of events were distinguishable (usually with scene shifts), two or more dreams were counted. Thus, 286 awakenings obtained from all REM periods across two nights yielded 322 dreams. Following each report, subjects rated their dreams on a bizarreness Likert-type scale ranging from one, "perfectly true to daily life", to six, "not at all true." Similar ratings were assigned by a judge, and an inter-rater reliability of .84 was found. The two bizarreness scores (rated by subject and rated by judge) were positively correlated ($r=.41$), but the modal subjects' rating was three (mainly true) whereas the modal judges' rating was five (very untrue). Given these results, it was concluded that there is considerably more bizarreness in REM dreams than is commonly recognized.

Zepelin (1989) makes a valid suggestion that the disparity between subjects' ratings and judges' ratings may be due to a lack of

knowledge of subjects' personal life on the part of the judges. This is a critical statement as it suggests that judges may assign more bizarreness to dreams than is actually perceived by subjects.

Unfortunately, Zepelin subsequently trivialized his statement as he suggested that the disparity between ratings may have been due to the sleepy state of the subjects and/or due to a lack of prior training or practice on the part of the subjects. Although it is possible that the state of the subjects may have influenced ratings, it seems obtrusively silly to suggest that subjects require training and practice to determine how realistic they considered their dreams.

As with all of the previous studies which have concluded that dreams are bizarre, Zepelin's study also possesses some limitations. Zepelin (1989) does not indicate the percentage of dreams which were rated three or lower. He stated that subjects rated their dreams a one "perfectly true to life" 17 percent of the time while judges rated them as such only 9 percent of the time. It would have been extremely useful had Zepelin indicated the percentage of dreams which were not bizarre. That is, only 17 percent of subjects may have rated their dreams as "perfectly true to life" but the

percentage which were rated less true, but not bizarre, may nevertheless have been a more valid indicator of bizarreness than the mode. Simply stated, Zepelin's statistics are not adequate to support his conclusion.

Another limitation of Zepelin's study, in contrast to Hobson's and Strauch's work, is that it does not permit one to examine the number or type of bizarre occurrences per dream. Fundamental to any analysis of dream bizarreness is that one must adequately quantify the concept, particularly if one is attempting to determine frequency as in Zepelin's case. Zepelin's Likert-type scale would not enable the researcher to ascertain if the predominant type of bizarreness violates natural laws of reality, or is simply situationally inappropriate. Thus, Zepelin's study does not present strong evidence for the traditional belief that dreams are bizarre. Similarly, this conclusion can be made for all previous studies which have determined that dreams are bizarre.

The previous pages have analyzed studies which have found that REM dreams are characteristically bizarre. The initial tendency to perceive a convergence between folklore and research disappears once the "veneer" is removed from the supportive studies. A closer

inspection of the research has revealed insufficient statistical analyses and disclosure, methodological deficiencies, and inadequate bizarreness scales resulting from erroneous, excessive, or simplistic operational definitions.

In contrast to studies which have found dreams to be bizarre, certain studies have suggested that dreams are actually mundane. The next section, dreams as mundane, will present evidence demonstrating that dreams are realistic representations of everyday life. One theory which suggests that the majority of dreams are mundane but also accounts for the presence of bizarre mentation was proposed by Antrobus (1986). An examination of this model will be followed by a review of the "dreams are mundane" literature.

SECTION 3.0 DREAMS AS MUNDANE

3.1 Cortical Activation and Perceptual Thresholds in Dreaming

Antrobus's model (Antrobus, 1986) was formulated after a model of waking nonperceptual mentation (eg., daydreaming) and proposes how dream reports can be produced by altering the waking state model. His model utilizes the Adaptive Control of Thought (ACT) Model. According to the ACT model, the system involved in

producing thought consists of three memories: working, declarative, and production. Working memory consists of information currently accessible, and may be retrieved from long-term declarative memory as well as temporary structures. Any declarative knowledge, permanent or temporary, that is in an active state would be contained in working memory. Procedural memory contains the information necessary to perform certain behaviours (eg., singing); that is, information not stored in declarative memory because it was never abstracted or stored in verbal or propositional form. The third memory, declarative, contains information typically classified as long-term memory. During dreaming, these memory systems become activated and it is proposed that dream imagery is generated by the visual and verbal production systems where it is subsequently reported, consisting of information stored in working memory. Working memory information, which is discussed next, consists of nodes or cognitive units.

The node is the active unit in the system and represents a segment of information or cognitive unit. These units are connected to one another in networks through which activation can pass from one unit to another. Working memory thus accounts for the

recollection of system productions, such as dream mentation (Antrobus, 1986). Although Antrobus (1986) states that the source of input within the ACT system during sleep is not known, he proposed that the external environment plays a critical role in this model.

Antrobus (1986) states that when the cortex is sufficiently activated to support cognitive processing, and there is inconsequential external stimuli, the individual will process information stored in the working and declarative memories as shown in day dreaming and sleep onset thought. If this train of thought continues while the individual is in the understimulated environment, and the imagery and thought persists until awareness of the immediate environment is lost, then the perceptual-cognitive system must accept the thoughts as representing the "real world" (Antrobus, 1986). This would occur regardless of whether the individual is asleep or awake. It is critical to note that the ACT model holds that any thought and imagery produced under these conditions would be hallucinatory by definition. At this time it would be appropriate to discuss bizarreness in the context of Antrobus's model.

According to this model, any substantial deviation in cortical activation from the range of normal waking activation may produce bizarre mentation (Antrobus, 1986; Reinsel, Wollman, & Antrobus, 1986). Thus, mental activity in all sleep stages may be more bizarre than ordinary wakefulness; however, the system is only active enough in REM sleep and sleep onset/offset to sufficiently store the bizarre information. As a result, discrepancies in mentation reports from various stages of sleep are dependent upon the difference in the number of words that describe the report (Total Recall Count); that is, REM and stage 2 mentation are alike in quality but differ only in quantity of recall. For example, a REM report "A yellow truck driving around the bottom of our swimming pool," (Antrobus, 1986, p.201) is bizarre whereas the stage 2 report "yellow truck", is not because the remainder of the mentation, "driving...pool", either could not be retrieved or was not produced by the system. Thus, the greater bizarreness in REM rather than NREM sleep is credited to a cognitively more activated sleep state which influences recall and production. Antrobus (1983) and Reinsel et al. (1986), have found support for this model.

As previously mentioned Antrobus (1983) examined 73 paired

REM/NREM reports obtained from 73 subjects. He concluded that REM mentation is typically free of bizarre or improbable images as only one third of the REM reports were judged more bizarre than the NREM member of the pair. The results of this study were interpreted as supporting the notion that cortical activation and perceptual thresholds account for characteristics of dreaming, such as bizarreness.

Reinsel et al. (1986) carried out two experiments in which they examined the effect of external auditory non-specific stimulation upon the disruption of thematic sequencing of spontaneous thought and imagery. They controlled the level of external stimulation by placing volunteer university students (12 subjects in experiment one and 14 in experiment two) into either a minimum (experiment one) or maximum (experiment two) sound-attenuation chamber. Subjects were instructed to keep their eyes open, lie down and relax without falling asleep. The experimenter contacted the subjects at intervals ranging from two to eight minutes and asked them to disclose everything that was going through their minds before the interruption. To compare the waking reports with those from sleep, Reinsel et al. obtained 50 paired REM

and NREM reports (i.e., 50 subjects) from sleep laboratories across the United States.

The waking reports obtained from subjects in the minimum and maximum sound attenuation conditions were found to be very dreamlike and to consist of long, thematically related sequences similar to Rechtschaffen's (1978) "single-mindedness" of dreams. With regard to bizarreness, waking reports evidenced the greatest amount, followed by REM mentation and finally NREM reports. The data were interpreted as supporting the ACT notion that when the cortex is sufficiently activated to support cognitive processing, and when there is minimal external stimuli, the individual will process information stored in memory. "In a noisy environment, by contrast, or one with 'significant' stimuli, the train of thought is disrupted, reorients to the waking environment, and becomes less dreamlike, more 'thoughtlike'" (Antrobus, 1986, p.209). Thus, unlike the ASH, Antrobus's model holds that perceptual conditions of REM sleep are not unique to sleep and can be duplicated in waking states.

Antrobus (1987) subsequently elaborated on his model and accounted for cortical asymmetry and bizarreness by suggesting that much of the bizarreness found in REM reports occurs when the

left hemisphere attempts to account for strange characters produced in the right hemisphere. He suggested that under reduced cortical activation, and high perceptual thresholds, the right hemisphere may produce imagery which is improbable in the context of the mentation. The left hemisphere, which normally dominates the dream sequence, strives to produce a narrative consistent with stored information concerning the real world. If the strange imagery is sent to the left hemisphere, and if the left hemisphere is active enough during REM sleep, it is "recognized" as inconsistent with the left hemisphere mentation sequence and the sequence is modified to produce an image as congruent as possible with "real world" information stored in declarative memory. This stored information is retrieved by the spreading of activation from the nodes activated in the mentation sequence. For example, if a character suddenly changes in a dream then the dreamer must construct a plausible scenario to account for this, an account which may seem strange after recall and awakening from sleep.

One difficulty with this model on a theoretical basis is the controversy surrounding cortical asymmetry. Within the last two decades the concept of hemispheric asymmetry in the dream

research community has changed from one of right hemisphere dominance to one of left hemisphere dominance (Antrobus, 1987) with other researchers suggesting balance during sleep. Armitage (1986) has suggested that there are variations in hemispheric balance rather than activation during sleep. In light of the controversy surrounding hemispheric symmetry during sleep, Antrobus's theory should be considered as possessing limitations.

Consistent with Antrobus's statement that REM mentation is not usually bizarre, there is a body of dream research which has content-analyzed dreams for bizarreness and has concluded that the majority of dreams are realistic. This literature suggests a divergence from the traditional folklore assumption of dream bizarreness.

3.2 Divergence of Folklore and Research

The divergence of folklore and research can be demonstrated by studies which hold that the majority of dreams consist of commonplace elements (E. Dorus et al., 1971; Giora, 1981; Hall & Van de Castle, 1966). Rechtschaffen (1978) stated that bizarreness is neither unique to nor distinctive of dreaming. He added that relatively few dreams are very bizarre, and that the reputation for

bizarreness has remained because bizarre dreams are most recalled and savoured.

Snyder (1970; Snyder, Karacan, Tharp, & Scott, 1968) examined the prevalence of bizarreness in dreams and stated that in an assessment of 635 REM laboratory dreams obtained from 58 young men and women 90 percent of the dreams could have been considered credible descriptions of everyday waking experience. However, Snyder's (1970; Snyder et al., 1968) definition of bizarreness as "outside the conceivable expectations of waking life....for example, a cat turning into a rabbit" (1970, p. 146) has been criticized by Zepelin (1989, p. 161) as "an overly demanding criterion."

E. Dorus et al. (1971) examined the incidence of novelty in 119 REM dream reports obtained from 16 women (12 university students; 2 nurses; 2 housewives). Six categories were used to rate novelty in terms of characters, physical surroundings, social interactions, and overall dream. Elements in category one were considered an exact replication of something previously experienced; category two was a replication of a previous experience with minor changes; category three involved major changes from original experience; category four was not previously experienced but the dreamer could readily

imagine it being experienced; category five was not previously experienced and was considered very unlikely; and category six consisted of those elements not previously experienced and extremely unlikely to ever be experienced by the dreamer. Two judges rated the dreams and the reliability for characters was found to be 94.6 percent; 84.5 percent for physical surroundings; 64.3 percent for social interactions; and 53.1 percent for the overall dream. Categories 1 and 4 accounted for 66 percent of "physical surroundings" elements and 83.4 percent of "characters", but accounted for only 21.8 percent of "social interactions" and only 23.2 percent of overall dreams. It was concluded that bizarre elements are rare in dreams and that elements in a dream may be considered novel, but not unlikely.

Although E. Dorus et al.'s (1971) novelty categories may be used to determine the frequency of occurrences of novel or bizarre dream elements, it fails to adequately differentiate unlikely elements from those which defy natural laws (i.e., impossible according to the laws of physics). This is an important distinction because a dream element, such as being struck by lightning, may not have "been previously experienced, and [is] extremely unlikely [to]

occur in the dreamer's experience" (E. Dorus et al., 1971, p. 365), but does not defy natural laws and is thus not impossible

E. Dorus et al. (1971) suggested that there was more novelty found in overall dream ratings because the novel element in a dream may stand out over the rest of the dream and thereby influence the novelty rating of the dream. Although dreams as a whole were rated more novel than individual elements, the incidence was lower than that expected by the popular conception of dreams (E. Dorus et al.). The authors proposed five possible explanations to account for the exaggeration of dream novelty and the traditional belief that dreams are bizarre.

The authors (E. Dorus et al., 1971) suggested that the tendency for dreams to become more unusual and exciting later in the night may correspond to morning awakenings and hence our tendency to recall the most unusual dreams of the night. Another possibility is that bizarre dreams may tend to awaken us and increase our likelihood of recall. A third explanation is that bizarre dreams may be the most dramatic and therefore last the longest in memory. Some of our dreams may have perceptual features (eg., intense colour, or an unusual, nonverbal quality about them) which may

contribute to their bizarre reputation. The fifth and final account for the bizarre reputation of dreams is that they are hallucinatory experiences regardless of content. The following quote elaborates on this...

Perhaps if we had heard some of our dreams as stories made up by others, we would not think them so unusual as when we have awakened from them to realize that they had occurred spontaneously in our own minds, without our conscious control, and without our having appreciated their unreality (E. Dorus et al., 1971, p. 368).

Another study which concluded that the majority of dreams are mundane was conducted by Hunt et al. (1982). Their scale contained four dimensions of dream anomalies (perception, performance aspects of reasoning and memory, states of consciousness, and interpersonal relations) which are considered as dream bizarreness. Anomalies of perception include: psychedelic transformations of formal properties of vision; unlikeliness in objects perceived without formal distortion; impossible settings or contexts; unlikely auditory content and formal distortions of language. Irregularities of reasoning and memory consist of clouding - disorganization and confusion in reasoning, of affect, motor coordination, attention,

speech, irrational insights, as well as difficulty in dream recall after awakening and disturbance of memory within the dream. Deviations in interpersonal relations involve affective detachment as found in schizoid withdrawal, or bizarre personification and identity change. The state of consciousness dimension, as well as the interpersonal relations, tend to be more global with the state of consciousness being a general indication of level of consciousness or level of arousal. Through the use of this system they examined 479 home dreams, 166 laboratory dreams, 35 "fantastic" dreams, and 35 "realistic" dreams, all obtained from undergraduate university students. Furthermore, they examined 32 of Freud's dreams and 34 of Jung's dreams.

The results of the study indicated that home dreams tended to be more bizarre than lab dreams, but the majority of both home- and lab-collected dreams were not bizarre. Specifically, one-third of these dreams evidenced no bizarreness and the remainder contained only "mild" levels (Hunt et al., 1982). According to Hunt et al. there was a relatively low probability of occurrence for most categories of dream bizarreness. The fantastic-realistic and Freud-Jung samples, on the other hand, may have helped to establish the range

of dream bizarreness.

The fantastic-realistic dreams evidenced an overall range of bizarreness from approximately 50 - 75 percent. This tended to be above or below most other samples with the exception of Jung's dreams which were higher in bizarreness in some categories than the fantastic sample. For example, 38 percent of Jung's dreams demonstrated the bizarre category of "uncanny emotion" whereas this was found in only 17 percent of the fantastic sample.

According to Hunt et al. (1982) Jung's dreams indicated a style of bizarreness, such as "uncanny emotion", which may account for his unique formulation of dream theory. That is, Jung's dreams tended to be archetypal, characterized by elements such as "uncanny emotion", which explains why he regarded amplification as the appropriate method of dream interpretation. His predominantly mythical, highly emotional dreams required amplification so they could be "finished" (i.e., interpreted). Hunt et al. also suggested that Freud's dreams may have contributed to the creation of Freudian dream theory.

Freud's dreams, in contrast, evidenced high levels of bizarreness which may explain why he considered the manifest

dream to be unintelligible. If the reader recalls section 2.1, Freud's theory required that the coherence of a dream be disregarded, and broken down into fragments so that it would be intelligible. If Freud had predominantly bizarre and confusing dreams, as suggested by Hunt et al.'s (1982) data, then breaking down the manifest dream through free association to arrive at the latent dream would have been an appropriate technique to make the dream intelligible. All in all, the data analyzed by Hunt et al., and the broad bizarreness scale used, represent the most extensive attempt to date to determine the level of bizarreness in a variety of dreams. However, the scale which was used contained some deficiencies which must be addressed.

There are instances where Hunt et al.'s scale (1982) is ambiguous, some of which are acknowledged. For example, the "hallucinations of setting" category is an extreme classification with the content representing impossible occurrences, and it was suggested that it could be divided into subtypes. Furthermore, some of the clouding categories demand closer inspection. In particular, Hunt et al. accept that "memory about" confusion may represent mnemonic barriers of the REM state rather than phenomenology of

the dream, but it is possible that the "memory within" category may also be a recall problem. They also suggest that the category of clouding may be overestimated as the confusion category was used as a catch-all for unspecified elements. The question, of course, involves whether the clouding existed during the dream or whether it was subsumed within the broad-based definition. A consideration of the clouding category reveals that a large variety of experiences may be classified as disorganizations, disturbances, difficulties or confusions.

This section has considered the dream literature which has determined that dreams, REM or otherwise, are characterized by features of everyday life. A critical analysis of the bizarreness scales has revealed much discrepancy in the definitions used. Furthermore, these discrepancies in definitions have contributed to variations in the frequencies and types of bizarreness which have been found. Although the "dreams are mundane" literature has examined more dreams from a wider variety of sources than the "dreams are bizarre" literature, the issue of inadequate bizarreness scales resulting from erroneous, excessive, or simplistic operational definitions, remains. As a result of the theoretical and

methodological weaknesses which dominate the dream bizarreness literature, it is necessary to re-examine the entire approach to this cognitive aspect of dreaming. It is essential that factors that could possibly influence a measure of bizarreness be considered.

Specifically, dream report length, and the issue of home-collected versus laboratory-collected dreams must be addressed.

Furthermore, any measure of dream bizarreness must take into account bizarreness in wakefulness, and the possibility of distinct styles of dreaming accompanied by multiple varieties of dreams.

Most importantly, an examination of dream bizarreness must deal with the semantics of the term "bizarre". The following section addresses these issues.

SECTION 4.0 BIZARRENESS - A CRITICAL ANALYSIS

4.1 Dream Report Length and Bizarreness

It has been found that the length of dream reports are highly correlated with measures of bizarreness (Hall & Van de Castle, 1966; Hobson, 1987; Hunt et al., 1982; McCarley & Hoffman, 1981; Snyder, 1970). This finding has been obtained regardless of the study's conclusion or definition used, and has raised the issue as to whether dream length is an artifact to be eliminated. Porte and

Hobson (1986), for example, have used a procedure to hold dream length constant and control for this known correlation. Although it may not be possible to separate dream length from bizarreness when collecting data, it is necessary to make a distinction between the techniques of data collection which often influence both dream length and content.

4.2 Home-collected versus Laboratory-collected Dreams

Research has suggested that the mere location of dream collection may influence the content of the reports (Dement, Kahn, & Roffwarg, 1965; Whitman, Pierce, Maas, & Baldrige, 1962). Whitman et al. (1962) found that 68.5 percent of all dreams elicited by the REM technique dealt either directly or in a disguised manner with the experimental situation. Another study (Dement et al., 1965) found that the incidence of references to the sleep laboratory in the manifest dreams dropped from 24.7 percent on the first night to 3.9 percent on the second night. However, no further evidence of habituation was found when excluding the first night. Other research has suggested that differences in specific aspects of dreams, such as bizarreness, may be due to the dream-collection

technique rather than the location.

Foulkes (1979, 1985) has stated that dreams are probably not as bizarre as traditionally believed because the impression of dream life comes from dreams that are remembered by chance. It is only in a sleep laboratory that an experimenter can systematically awaken an individual, and thus gather and expose a representative sample of dream life. Bizarre dreams are a biased sample of all dreams produced during sleep and they are remembered precisely because they are odd or unusual (Foulkes, 1985). Foulkes' position regarding dream bizarreness is supported by other research.

Hunt et al. (1982) reported that the majority of home and laboratory dreams showed relatively low levels of bizarreness, although home dreams tended to be more bizarre than laboratory dreams on some measures. This is consistent with other research that has concluded that most laboratory REM dreams are realistic while home dreams are livelier (Hall & Van de Castle, 1966; Ruf, 1972). Thus, any examination of bizarreness in dreams should address the issue of location of the data collection. Given that home recalled dreams are likely to contain more bizarreness than a sample of dreams obtained in the laboratory, then a finding of low

bizarreness in home dreams would imply an even lower prevalence of bizarreness in laboratory dreams.

Recall from section 1.0 that the fundamental purpose of examining bizarreness is to assess whether dreams are mundane or bizarre and to determine whether this mentation is radically dissimilar from waking thought. It is therefore essential to determine which elements of bizarreness may be found in wakefulness. Particular research has proposed that bizarreness is found in wakefulness and has also suggested that individuals may possess distinct "styles" and "types" of dreams.

4.3 Bizarreness in Wakefulness and Dreams - Evidence for Individual Styles of Dreaming and the Multiplicity of Dreams

As mentioned earlier, Reinsel et al. (1986) found that individuals placed in a sound-attenuated room evidenced more bizarreness than either REM or NREM reports. The explanation given for this was that external stimulation disrupts spontaneous mentation and that lack of stimulation in wakefulness would produce a situation conducive to the creation of long thematic sequences and an increase in bizarre thought. The finding that wakefulness produced more bizarreness than REM mentation is

striking as it suggests that bizarre thought is not due to a unique psychophysiological state. Other research which has examined daydreaming, meditation, and dream "types", suggests that bizarreness is not limited to the sleeping mind, and also proposes that certain individuals may possess a "style" of thought which contains elements often considered bizarre.

In a study concerning daydreaming styles and nocturnal dreaming, Starker (1977) asked 48 subjects to write down, upon arousal, every dream they could recall for 16 consecutive mornings and compared these with daydreaming styles. The daydreaming styles were determined by having subjects complete the Imaginal Processes Inventory (Starker, 1973) and then grouping the individuals into one of the three categories: Positive-Vivid, Guilty-Dysphoric, and Anxious-Distractible. Previous research (Starker, 1974) found that subjects in the Anxious-Distractible group had the most bizarre daydreams and nocturnal dreams, while the Positive-Vivid group scored lowest on bizarreness for both day and nocturnal dreams.

The dream diaries (420 dreams recalled) were analyzed by two independent judges for "bizarreness". Judges also assessed other

variables such as positive affect, and frustration. The judges had to estimate to what extent the dream departed from reality on a scale from 1 (a "realistic" dream) to 5 (a wild and impossible dream).

Although Starker did not examine whether the majority of his sample of dreams were bizarre or mundane, he found a statistically significant correlation between dreams and daydreaming style. As predicted, individuals in the Positive-Vivid group had significantly less bizarreness in their dreams than either the Guilty-Dysphoric subjects or the Anxious-Distractible subjects. As well, Guilty-Dysphoric individuals had significantly less bizarreness than those in the Anxious-Distractible group. Thus, subjects who had realistic daydreams also had realistic dreams, while subjects who had bizarre, improbable daydreams had bizarre, improbable dreams.

If one applied a scale of bizarreness, such as Hobson's or Strauch's, to experiences during meditation then evidence of bizarreness can also be found to occur. For example, Hunt & Chefurka (1976) reported that individuals who are concentrating on a blue vase for 10 minutes often perceive visual hallucinations, and an altered state of consciousness. According to Antrobus, Singer, Goldstein, and Fortgang (1970, p. 242) the frequent deviation of our

thoughts, labelled "scene shifts" or "gaps" by others (Hobson et al., 1987; Hunt et al., 1982; McCarley & Hoffman, 1981), are a common feature of wakefulness akin to "the restless wandering of a child who simply cannot or will not learn to do what [she/] he is told". To "calm" this "restless child" many individuals have attempted to meditate and have found that during the early stages of a structured meditative practice (eg., breath counting) intrusive and discontinuous thoughts (i.e., scene shifts and gaps) will frequent the mind. Leshan (1974) has stated that this is a typical experience for the beginner of meditation. The meditative tradition therefore demonstrates how aspects of bizarreness can also be found in wakefulness.

Others have suggested that "types" of dreams and "styles" of dreaming may contribute to an understanding of bizarreness. In his book, The Multiplicity of Dreams, Hunt (1989) suggested that there are a variety of dream "types" which include the following: realistic dreams; bizarre dreams; nightmares; lucid dreams; archetypal dreams; titanic dreams; and Mandala-pattern dreams. Realistic dreams, as one would expect, exhibit the least amount of bizarreness whereas other dreams generally display more

bizarreness. Bizarre dreams by definition present more bizarreness than realistic dreams; however, a titanic dream (i.e., an intense dream which may show "primitive" aggression, mutilation, dismemberment, and kinesthetic sensations of flying, floating, falling and spinning) may evidence more bizarreness than the "average" bizarre dream. As previously mentioned (see section 2.2) Hunt (1989; Hunt et al., 1982) considers individuals to dream in particular idiosyncratic fashions which may influence the creation of an individual's dream theory.

As further evidence for individual styles of dreaming, Giora (1981), Hunt (1989), and Strauch (1988) found that the degree of bizarreness varied considerably between subjects. According to Strauch (1988) only one of 13 subjects reported bizarre elements in all of her 9 dreams, whereas one subject reported bizarre elements in only 3 of her 9 dreams. In light of the suggestions for a variety of dream experiences ("types" or "styles"), and for evidence of bizarreness in wakefulness, it is important to scrutinize the literature for definitions of bizarreness. The following section discusses the concept of bizarreness and compares and contrasts various definitions found in the literature.

4.4 What is "bizarreness"?

Gilman (1983) considered the etymology of the word "bizarre" and reported that the first modern appearance of the word "bizarre" was in Dante's poem entitled "Inferno." "Bizarre" referred to an individual's cruel psychopathological spirit and inarticulate anger which possessed a frightening aspect. During the Renaissance the term "bizarre" underwent a transformation and was used to characterize not only the choleric but also the unique, repulsive, and capricious. This emphasis on the unique remained throughout the seventeenth century and by the eighteenth century the original core meaning of the word as aggressive and the inarticulate had been replaced with a definition focusing primarily on uniqueness. The "bizarre" was considered to be eccentric thought or action and continued to have a negative connotation. However, by the end of the nineteenth century the eccentric or extraordinary sense of "bizarre" was altered to include the more positive attribute of creativity. In the twentieth century a glance through any modern dictionary indicates that the term "bizarre" is considered to be unusual, odd, whimsically strange, or eccentric. It is this sense of the term which has been used in all studies that have analyzed bizarreness in

dreams.

Twelve articles (three additional articles were not included because of similar authorship and definitions) and one book which discussed bizarreness were compared for similarities in the definition of bizarreness (Cox & Wollen, 1981; E. Dorus et al., 1971; Freud, 1900; Gilman, 1983; Giora, 1981; Hobson et al., 1987; Hunt et al., 1982; Kendler, Glazer, & Morgenstern, 1983; McCarley & Hoffman, 1981; Snyder, 1970; Starker, 1977; Strauch, 1988; Zepelin, 1989). Three papers did not deal specifically with dream bizarreness although they did consider and define some aspect of bizarreness (Cox & Wollen, 1981; Gilman, 1983; Kendler et al., 1983). The results of the contrast and comparison demonstrated that there are "core" semantics to the term but that there are also vast differences, particularly in quantification scales which have been used.

Some of the more comprehensive scales (Hobson, 1987; Hunt et al., 1982; Strauch, 1988) have considered bizarreness in plot, setting, characters, or affect. This is in contrast to the studies which have simply used global measures to determine the realism of the dream (Starker, 1977; Zepelin, 1989). Although all bizarreness

scales differ in terms of complexity and definition of bizarreness, Hunt (1988, personal communication) holds that Hobson's scale and his own are largely similar in their measure of bizarreness and may only differ in their measure of bizarreness of affect.

All of the twelve articles reviewed (including Freud, 1900) related bizarreness in one way or another to reality. This is significant because it is the only universal denominator among the articles. Improbability was used to denote bizarreness in 69 percent of papers, impossibility was found in 54 percent, and sudden scene shifts or gaps were discussed in 46 percent. Of the studies that attempted to quantify bizarreness (there were 10 in all) four used Likert-type scales as global ratings and six used more sophisticated scales to measure bizarreness.

Hobson et al. (1987; Porte & Hobson, 1986) and E. Dorus et al. (1971) failed to differentiate unlikely elements from those which defy natural laws. Specifically, Hobson combined impossible events and improbable events in his definition of bizarreness. He considered events improbable if their chance of occurrence was less than one in twenty. This definition is somewhat arbitrary and problematic as it would be difficult to ascertain the exact or even

approximate probability of a given event. A similar conclusion can be made concerning the novelty scale used by E. Dorus et al. Their scale is inadequate when discussing bizarreness because items not previously experienced and extremely unlikely are not necessarily bizarre. Thus, as all previous studies have used reality when discussing bizarreness, it is necessary to differentiate those intrinsically bizarre-impossible dream elements (i.e., those which defy the natural Newtonian laws of waking reality) from those unlikely to occur (i.e., improbable).

The universal consensus of a definition for bizarreness is that an item (i.e., action, character, setting, affect) must be compared to some measure of "reality." When an attempt to define bizarreness goes beyond "reality" this consensus disappears. Specifically, there is a diverse approach in the literature towards the use of "impossible", "improbable", and "scene shifts" when defining bizarreness. Theoretical models which subsequently define bizarreness and utilize the definitions are determinants of the type and frequency of bizarreness found. This is addressed in the following section.

4.5 Semantic and Theoretical Orientations as Determinants of Bizarreness

The fundamental shortcoming of the majority of research into bizarreness is an inadequate critique of the concept of bizarreness and the operational scales used to define it. Most research has failed to assimilate the strengths, and eliminate the weaknesses, of prior investigations into bizarreness. Certain investigators, Hobson for example, appear to have formulated a theory, and have employed bizarreness frequency to support the theory. Moreover, the data obtained by many researchers often merely reflects their preference for particular operational definitions.

Returning again to Strauch's (1988) definition of bizarreness, she considered bizarreness in dream form to appropriately represent dream bizarreness. This is similar to Hunt et al.'s (1982) clouding in that it may portray mnemonic barriers of the REM state which influence a RLM report so as to make it bizarre. Perhaps more interesting is the difference in conclusions reported by Antrobus (1983) and Porte and Hobson (1986) who apparently analyzed the same data.

Recall that Porte and Hobson (1986) concluded that REM

mentation is more bizarre than NREM reports. Although Antrobus (1983) found that REM reports are more bizarre than NREM mentation he concluded that most REM dreams are not very bizarre. This can be explained through the operational definitions, and pre-existing theoretical models used. Antrobus's concept of bizarreness (1978) as the dream elements which have an improbable occurrence in wakefulness is not as extensive as Hobson's (see section 2.2). Furthermore, his model holds that the majority of dreams are mundane rather than bizarre, and thus he should interpret his data as indicating the mundaneness of dreams. In contrast, Hobson's theory dictates that dreams are bizarre because it holds that the process of dreaming is the result of sporadic neural activation and inadequate synthesis - logical, commonplace dreams would refute his theory and hence Hobson's requirement that all dreams be bizarre.

In order to attain a comprehensive examination of bizarreness it is necessary to redefine it for the purpose of the present study. This definition, which is given in section 4.7, must account for the various criticisms previously outlined. As the definition of bizarreness is the crucial determinant, it is essential that it is neither too broad nor too restrictive.

4.6 Exclusion of "Plot" as a Bizarre Item

The current critical analysis of bizarreness, which incorporates aspects of reality, necessitates an analysis of "dream plot". Hobson (1988) vaguely defines dream plot and refers to conflict as one element in the creation of a plot. He and his colleagues consider the bizarreness of dream plot to contribute to the changes in background (orientation of the dream, characters and actions) which contrast with the stability of the foreground (theme and dream structure; similar to Rechtschaffen's singlemindedness). Other investigators (E. Dorus, et al., 1971; Strauch, 1988; Zepelin, 1989) have not delved into this issue.

In a discussion of literary terms, Beckson & Ganz (p. 167, 1975) define plot as the "organization of incidents in a narrative or play." The organization of the causally-related events determines whether or not a plot is present. However, one incident, an afternoon's cruise for example, does not make a plot, no matter how interesting the afternoon may have been. These incidents should grow one upon another with incident two following incident one by a causal relationship. In a story with a closely knit plot, the removal of one incident would bring the whole structure down upon one's

head as much as though one had removed an important property from the scaffolding for a building. In a narrative of mere unrelated incidents, the removal of one incident would simply leave a gap.

Beckman and Ganz (1975) further describe the components of a plot which consist of exposition (point A), through crisis and conflict to a peak at climax (point B) where there is conflict resolution resulting in a denouement and finally a conclusion (point C). It is clear from this discussion of the English literary sense of "plot" that the majority of dreams will simply not manifest this property. This is particularly evident when one considers the average length of sleep mentation reports, which limit the explication of a plot. As a result of this investigation into "plot", the element has been omitted from the present definition of bizarreness.

4.7 Bizarreness Redefined

Bizarreness will still be considered to represent the strange or unusual characters, settings, actions, events, objects, thoughts or feelings in sleep mentation. However, the "redefined" notion of bizarreness utilizes reality, and separates the impossible from changes/gaps, the improbable, and the uncertain (see also Method

and Appendix A). This immediately allows for the distinction of the intrinsically-impossible from elements which are unlikely, but not beyond the human capacity to experience. The distinction between impossible and improbable in discrete rather than continuous terms suggests a "core aspect" of bizarreness which may only be evidenced by a minority of dreams. It will be subsequently suggested that the inadequate term "bizarre" be eliminated and be replaced by the "impossible/improbable dimension of dreams."

Although dreams have been stereotyped as bizarre, there has been only one systematic investigation into bizarre aspects of nightmares (Spadafora & Hunt, in press) despite the tendency to consider nightmares to be strange, vivid dreams. It is possible that nightmares may be less bizarre than pleasant dreams, and may be so intense, vivid, and frightening because of their realism. Hartmann (1984) suggests that nightmares tend to occur in D-sleep (Hartmann's term for REM sleep) and this may be important in terms of bizarreness because of Hobson's view that all dreams are bizarre and occur during REM sleep. If nightmares, which are reviewed next, are found to be realistic, then this would contradict the ASH.

SECTION 5.0 NIGHTMARES

The typical nightmare is usually considered to be "frightening...unlike waking experience...intense and 'different'" (Hartmann, 1984, p.3). According to Hartmann (1984) general adult themes involve fears (such as being chased or attacked), which often persist into wakefulness and are frequently confusing for the dreamer. There is considerable variability in the frequency of nightmares experienced by individuals. D. Belicki and K. Belicki (1982) observed that 26 percent of university undergraduates reported less than one nightmare per year, 64 percent reported between one per month and one per year, and 10 percent reported more than one per month. Feldman and Hersen (1967) also found that 24 percent of individuals reported less than one nightmare per year while 47 percent reported one per year or more. Another 24 percent reported one nightmare per month and the final 5 percent reported one or more nightmares per week. Similarly, a survey of 1006 individuals living in the Los Angeles Metropolitan Area found that approximately five percent of the population complained of a nightmare once or more per week (Bixler, Kales, Soldatos, Kales, & Healey, 1979). A frequency of more than 12 nightmares per year is

considered to be high by some researchers (K. Belicki, 1987, personal communication; Kales et al., 1980). Although nightmares are very common in childhood some people experience nightmares throughout their lives, while others only during a period of stress or after a traumatic event (Hartmann, 1984). Moreover, some individuals never recall experiencing a nightmare.

Although most nightmare studies have only considered nightmare frequency, Belicki (1985) examined how closely this was related to nightmare distress. The subjects, 210 university students, reported a range of zero to 300 nightmares in the prior year. It was found that nightmare frequency was not an ideal indicator of distress with nightmares.

Despite the inclination to consider nightmares as strange, the present author could only locate one study which specifically considered the impossible and improbable in nightmares (Spadafora & Hunt, in press). Analysis of data obtained from 41 introductory psychology students failed to reveal any significant differences in bizarreness between archetypal, lucid, fantastic nightmare, and control dreams. The paucity of previous research into bizarreness in nightmares dictates an exploration of this issue.

5.1 A Traumatic Etiological Theory

Hartmann (1984) and others distinguish post-traumatic nightmares from the general category of nightmares. The content of post-traumatic nightmares is repetitive, more like a memory which is repeated, than like a dream or fantasy. Such nightmares usually accompany post-traumatic stress disorder or follow a stressful childhood experience, such as a serious automobile accident.

According to Hartmann (1984) post-traumatic nightmares appear to possess aspects of night terrors and nightmares as they have been reported to occur out of REM sleep (Greenberg, Pearlman, & Gampel, 1972), and out of stage 2 sleep (Schlosberg & Benjamin, 1978).

The possibility of a traumatic etiology - "a sexual or physical attack" - for nightmares has been noted in the literature (Burgess & Holmstrom, 1974; Ellenson, 1985; Esper, 1986; Lindberg and Distad, 1985), but according to Hartmann (1984) there is little support for this view. Some research implies that such an etiological explanation cannot be ruled out. As previously mentioned, Lindberg and Distad (1985) stated that symptoms exhibited by 17 women sexually abused during childhood or adolescence appear to fit the features of a chronic and/or delayed PTSD. Garfield (1987) stated

that "in almost every case of child abuse - physical as well as sexual - nightmares and sleep disturbances escalate" (p.93). Thus, contrary to Hartmann's belief, sexual and physical abuse in the general population may represent a frequently occurring traumatic etiology of nightmares.

In a survey of 930 adult women, Russell (1983) found that when both categories of sexual abuse were combined (extra- and intrafamilial), 38 percent of women reported at least one experience before the age of 18 years, and 28 percent reported at least one such experience before the age of 14 years (Russell, 1983). Finkelhor and Hotaling (1984) reported that as many as nine percent of boys may have been sexually abused, while Cuddy (1990) found that approximately 25 percent of university women reported having been sexually abused. With regard to physical abuse, Straus and Gelles (1986) reported that 10 percent of children aged between three and 17 years were subjected to severe physical violence.

Cuddy's finding (1990) is particularly striking as it is often assumed that an individual requires a greater overall level of functioning to acquire a university education. This may help to explain some of the discrepancy in prevalence between studies

which have used university populations and those which have not (eg., Cuddy, 1990 versus Russell, 1983). Moreover, any long-term effects on university students who have been sexually abused may be less pronounced (due to a greater level of functioning) compared to those not attending university.

Perhaps one explanation for Hartmann's lack of support for a traumatic etiology for frequent or recurring nightmares may be that clients rarely volunteer that they have a history of incest or abuse. Ellenson (1985) found "that survivors [of sexual abuse] **even more rarely** [than those currently abused] reveal the presence of symptoms" (p.527). The symptoms outlined by Ellenson (1985) include recurring nightmares with themes of "catastrophes that endanger the client or family members or both; children being harmed or killed; client or family members or both being chased by attackers; and scenes of death or violence or both" (p.527). Thus, there is evidence in the literature to suggest that those who have been sexually abused may have frequent or recurring nightmares. Of the few studies that have researched this area (Garfield, 1987; Ellenson, 1985) only one has utilized a control group, such as physically abused individuals (Cuddy, 1990). Cuddy (1990), used a

sexual abuse, a physical abuse, and a control group, and found that women who have been sexually abused as children have significantly more nightmares, and more repetitive nightmares than a control group of women. The means for the physically abused group were in the middle range (i.e., between the control group and the sexually abused group) for both depression and nightmare frequency. The lack of any previous investigation into dream bizarreness of the sexually and physically abused requires that the current study explore this issue for any possible group differences.

Section 6.0 Present Study

To summarize, there exist two perspectives towards bizarreness in dreams. One perspective holds that most dreams are bizarre whereas the other view holds that most are mundane. However, neither one of these perspectives have adequately considered the issue of bizarreness in nightmares. A traumatic etiological theory of nightmares (i.e., frequent nightmare reporters may have been sexually abused) has been suggested. Unfortunately, there has been little research specifically examining this issue, and there has not been an investigation into possible group differences (i.e., abused vs. non-abused individuals) in bizarreness. As a result

of the review into these topics, the following hypotheses were formulated.

Hypotheses

As previously mentioned, the present study will assess the amount of bizarreness and realism in dreams and nightmares, and will explore the degree of bizarreness and realism in nightmares. The amount of bizarre content in nightmares is expected to be greatest in subjects' "worst" nightmares, least in subjects' "dreams", and in the middle for "typical" nightmares. Approximately one third of dreams and one half of nightmares will be expected to possess bizarre elements. The most common type of bizarreness will involve unlikely or inappropriate events/objects. Consistent with past research, it is anticipated that bizarreness will increase with dream length. Furthermore, the dreams and nightmares of subjects will be examined for indications suggesting possible styles of dreaming (i.e., bizarre or realistic).

The nightmares and dreams of a sexually abused, a physically abused and a non-abused group, will be compared and there will be an exploration for bizarre content. The dreams and nightmares of sexually abused individuals will be expected to exhibit a greater

degree of improbable affect.

Method

Subjects

The subjects, 71 women and 31 men (mean age 21 years for women, range 18 to 42 years; mean age 20 years for men, range 18 to 25 years) enrolled in a first-year undergraduate psychology course, voluntarily participated in a study on dreams and nightmares. The individuals represented a range of infrequent to frequent dream recallers, and infrequent to frequent nightmare recallers.

An examination of the data reported by the subjects revealed that they recorded a total of 67 dreams, 90 "worst" nightmares, and 74 "typical or most recent" nightmares. A total of nine subjects failed to recall any dreams or nightmares while 18 subjects recalled only one dream or nightmare. Thirty-two of the subjects recalled two nightmares or one nightmare and one dream, and 43 individuals recalled two nightmares and one dream. In response to the Major Events Inventory, seven women and one man reported having experienced both sexual and physical abuse; seven women and six men reported having experienced physical abuse only; eight women

reported sexual abuse only.

Materials

As an introduction, subjects were given brief definitions of nightmares and night terrors. The subjects also completed a Biographical Questionnaire in which they provided information such as sex, age, marital status, number of children, major area of study, religion and other personal information.

A Nightmare and Sleep History Questionnaire was given to individuals to obtain details pertaining to average length of sleep per night, dream recall frequency, nightmare frequency, and night terror frequency. Information pertaining to repetitive nightmare frequency was also obtained. This questionnaire consisted of 5-point and 6-point Likert-type scales and is shown in Appendix B.

The Major Events Inventory was given to subjects to ascertain any major, stressful experiences which they had experienced, including unwanted sexual activity and physical abuse. Positive items (i.e., winning a scholarship or a lottery) were also included to prevent subjects from ascertaining the true purpose of the scale.

The Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was completed by subjects and consists of

21 groups of statements in which subjects selected one or more statements from each group that best described the way they had been feeling in the past week (see Appendix D). The statements in each group are scored from 0 to 3 and overall BDI scores may range from 0 to 63. A score between 1 and 10 does not indicate any depression; 11 to 16 indicates mild mood disturbance; 17-20 indicates borderline clinical depression; moderate depression is indicated by a score between 21-30 whereas 31-40 indicates severe depression; an individual who scores over 41 is extremely depressed.

Subjects were given instructions for recording nightmares and dreams, and provided an account of their "worst" nightmares, "typical or most recent nightmares", and "typical or most recent pleasant dream".

Procedure

The subjects were given a questionnaire booklet which included a consent form, a biographical questionnaire, a definition of nightmares and night terrors, a nightmare frequency questionnaire, the Beck Depression Inventory, the Major Events Inventory, and instructions for completion of the dream and nightmare reports. The subjects completed the questionnaires at home and returned them

within one week. Following completion of the questionnaire, they were provided with information regarding the purpose of the study.

Scoring of Dreams

Two bizarreness scales will be used in this study to more adequately analyze the concept of bizarreness in sleep mentation (see Appendix A). Dream reports scored on the CUSII, excluding comments upon, or interpretations of the dream, were broken down into sentences. The sentences were then examined for the following items: (1) character; (2) setting; (3) action; (4) event/object; (5) speech; (6) thoughts; (7) affect. Once an item was located it was then assessed on one of five dimensions: (A) impossibility; (B) sudden/slow changes; (C) improbability; (D) uncertainty/vagueness/confusion; and (E) realism. Any elements which did not belong in one of the four bizarreness dimensions were assigned a score and placed in the realistic/mundane dimension. The realistic dimension represented the core element of bizarreness and is universally accepted within the literature.

Impossibility in character (A-1), setting (A-2), action (A-3), object (A-4) and speech (A-5) were considered to occur when the natural Newtonian laws of waking reality were defied; that is, an

item was considered impossible if it could never possibly be experienced or encountered. For example, flying without any mechanical aid would be considered impossible action (A-4).

Character, setting, action, object and speech impossibility are the only acceptable elements for this category, as cognitions and affect are typically improbable/inappropriate rather than inherently impossible.

Changes or ~~gans~~ (dimension B) may be either sudden or slow (i.e., metamorphosis of character, scene shift) and may permeate all of the other bizarreness dimensions. That is, an element in a dream may be a sudden change in impossible action (B-3), a slow change in improbable setting (B-1-7) or a sudden change in realistic action (B-22).

Improbability was considered to be unlikeliness and inappropriateness (features out-of-context) in character (C-1), setting (C-2), action (C-3), object (C-4), speech (C-5) thought of dreamer or dream character (C-6), or affect (C-7). These items were considered to be unlikely to occur but could possibly be experienced.

Uncertainty, vagueness, or confusion in character (D-1),

setting (D-2), action (D-3), object (D-4), speech (D-5), thought of dreamer or dream character (D-6), and affect (D-7) were also considered. Although other studies have used uncertainty (Hobson et al., 1987) and confusion (Hunt et al., 1982) to categorize the bizarre aspects of dreams, previous sections (see 3.2 and 4.4) have indicated the controversy surrounding this category.

The realism dimension (dimension E) was the final dimension in this scale. Dream elements (character, setting, action, object, speech, thought, affect) which were considered to be realistic were placed in this dimension. The inclusion of this dimension is crucial to an adequate understanding of dream bizarreness - no other study has been located which has simultaneously considered bizarreness and realism.

Another scale which was used to determine the level of bizarreness in dreams is the Carleton University Global Realism Scale (CUGRS). This scale was a 5-point Likert-type scale which considered bizarreness in terms of reality and possibility of future experience (see also Appendix A). Dreams which were entirely realistic/true according to daily life, and were replications of previous experiences, or could be experienced in the future, were

rated a "1". Dreams which were mostly realistic/true compared to daily life were assigned a "2". These reports were characterized as having been previously experienced, or could be experienced in the future, but contained minor novelties or minor improbabilities. Reports which were somewhat realistic/true and somewhat unrealistic/untrue were rated "3". Although these dreams have been previously experienced or could be experienced in the future they contained novelty and/or improbabilities. Dreams placed in category "4" were mostly unrealistic/untrue and contained mostly novel and improbable elements; however, some elements of the reports have been previously experienced or could be experienced in the future. Finally, category "5" consisted of dreams which were entirely unrealistic/untrue. These dreams have never been previously experienced and it was impossible that they ever could be experienced.

Results

Descriptive Statistics - General

Examination of the data revealed that 43 of the subjects (31 women, mean age was 21 years, standard deviation of 5.54 years with a range from 18 to 42 years; 12 men, mean age was 20 years,

standard deviation of 1.83 years with a range from 18 to 24 years) reported one dream and two nightmares. The remaining 59 individuals were eliminated from further analyses because of the incomplete data. However, to confirm that there was no disparity between the two groups, 5 independent sample t-tests were calculated (see Table 1). As anticipated, the two groups only differed on dream recall frequency.

CUSII and CUGRS Inter-rater reliability

To obtain data on inter-rater reliability, 30 sleep mentation reports (10 dreams, 10 "typical" nightmares, and 10 "worst" nightmares) were scored using the CUSII and CUGRS by an additional rater who was blind to the sleep mentation report types. The CUGRS was found to have an inter-rater correlation coefficient of .87, and a percentage concordance of 70. The percentage agreement increased to 90 when agreement was considered to be plus or minus one score. The Pearson r correlation coefficient for the CUSII was found to be .91 for bizarreness and .94 for realism. The raters identified a total of 86 occurrences of bizarreness with an overall percentage concordance of 80. There was 88 percentage concordance on the impossibility dimension, 83 percent concordance on the

Table 1Means and t-tests for Subject Groups

Variables	n ^a	Mean	SD	t	prob
Age	59	20.65	3.94	.18	.854
	43	20.49	4.78		
Sleep Length	59	446.95	40.05	-.84	.402
	43	439.54	48.72		
Dream Recall	59	2.98	1.04	2.69	.008
	43	3.58	1.20		
Nightmare Freq.	59	2.42	.79	.64	.524
	43	2.54	.96		
BDI ^b	59	8.98	6.23	.36	.716
	43	9.49	7.75		

^aTotal n=102; 59 subjects eliminated, 43 retained.

^bBeck Depression Inventory.

improbability dimension, 66 percent concordance on the uncertainty dimension, and 60 percent concordance on the sudden/slow change dimension. One judge scored the remainder of the reports through the application of the CUGRS and the CUSII. The statistical analyses of the CUGRS are presented next, and are followed by the analyses performed on the CUSII.

CUGRS

The means and standard deviations for the CUGRS are displayed in Table 2. Approximately 80 percent of dreams were assigned a rating of "1" or "2" on the CUGRS, while 53 percent of "typical" nightmares, and 35 percent of "worst" nightmares were given such ratings. Results of the application of the CUGRS to the sleep mentation reports are graphically displayed in Figures 1 through 4.

Chi square analyses and a one-way repeated ANOVA were utilized to examine the hypothesis that bizarreness would be more common in nightmares. The frequency distributions of bizarreness at the five levels of the CUGRS for dreams differed significantly ($X^2 = 44.33$, $df = 4$, $p = .0001$; see Figure 2) as did those for the "typical" nightmares ($X^2 = 22.70$, $df = 4$, $p = .0001$; see Figure 3) and the "worst" nightmares ($X^2 = 14.33$, $df = 4$, $p = .0063$; see Figure 4). A

Table 2**Means and Standard Deviations for the CUGRS^a**

Sleep Mentation Report	n	Mean	SD^b
Dreams	43	1.81	1.26
"Typical" Nightmares	43	2.74	1.78
"Worst" Nightmares	43	3.42	1.64
Dreams and Nightmares Combined	129	2.66	1.70

Note. ^aOrdinal scale.^bStandard deviation.

Figure one. Frequencies of dreams and nightmares assigned particular scores with the CUGRS.

Figure two. Frequencies of dreams assigned particular scores with the CUGRS.

Figure three. Frequencies of "typical" nightmares assigned particular scores with the CUGRS.

Figure four. Frequencies of "worst" nightmares assigned particular scores with the CUGRS.

chi square computed for the combined observed frequencies (i.e., $n = 129$) at the five levels of the CUGRS was also found to be significant ($X^2 = 50.96$, $df = 4$, $p = .0001$; see Figure 1). An ANOVA revealed significant differences between the sleep mentation reports on the distribution of ratings ($F(2, 84) = 11.45$, $p = .0001$), and the Scheffe post-hoc comparisons indicated a significant difference only between dreams and both nightmare "types".

CUSII

Means and standard deviations were computed for bizarreness and realism as scored on the CUSII scale (see Table 3).

Impossibilities, violations of physical laws of reality, were found in approximately 25 percent of dreams and nightmares.

Improbabilities, representing the most common bizarreness dimension, were found in 41 percent of the sleep mentation reports.

Uncertainties and sudden/slow changes occurred in 30 percent and 26 percent of the reports, respectively. Table 4 contains items from the CUSII scale which were not found in any of the dreams from the present sample. Clearly, the majority of these belong to the sudden/slow change dimension.

Figures 5 through 8 show the combined percentages of dreams

Table 3

Means and Standard Deviations as Scored with the CUSII

Means	<u>Sleep Mentation Report</u>		
	Dream	Typical Nightmare	Worst Nightmare
Word Count	45.63 (39.38) ^a	78.05 (74.30)	77.93 (50.67)
Realism Frequency	11.40 (8.85)	17.63 (15.48)	19.40 (14.22)
Impossibility	0.33 (1.23)	1.14 (2.86)	0.84 (1.43)
Improbability	0.86 (1.92)	1.16 (2.09)	0.91 (1.15)
Uncertainty	0.14 (0.41)	0.60 (1.12)	0.91 (1.23)
Sudden/Slow Changes	0.28 (0.70)	0.60 (1.20)	0.56 (0.93)
Bizarreness Densities	0.03 (0.05)	0.05 (0.06)	0.04 (0.04)
Realism Densities	0.28 (0.12)	0.23 (0.09)	0.25 (0.09)

^aStandard deviations in parentheses.

Table 4

Bizarre Items Not Present in Reports as Scored with CUSII

Items	
<hr/>	
impossible dream setting	sudden typical ^a speech
impossible worst ^b setting	sudden worst speech
uncertain dream action	slow dream speech
uncertain dream object	slow typical speech
uncertain dream affect	slow worst speech
uncertain typical affect	sudden dream thought
sudden typical character	sudden typical thought
slow dream character	sudden worst thought
slow typical character	slow dream thought
slow worst character	slow typical thought
slow dream action	slow worst thought
sudden dream object	sudden dream affect
sudden typical object	sudden typical affect
sudden worst object	sudden worst affect
slow dream object	slow dream affect
slow typical object	slow typical affect
slow worst object	slow worst affect
sudden dream speech	

Note. ^a"typical" nightmare

^b"worst" nightmare

Figure five. Percentages of dreams and nightmares possessing occurrences of bizarreness as scored with the CUSil.

of/de

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Figure six. Percentages of dreams possessing occurrences of bizarreness as scored with the CUSII.

Figure seven. Percentages of "typical" nightmares possessing occurrences of bizarreness as scored with the CUSII.

Figure eight. Percentages of "worst" nightmares possessing occurrences of bizarreness as scored with the CUSII.

and nightmares which did or did not contain bizarre occurrences according to the CUSII scale. Overall, 30 percent of dreams and nightmares ($n = 129$) scored with the CUSII did not possess any bizarreness while 17 percent of reports contained only one bizarre occurrence (see Figure 5). Figures 6 through 8 breakdown the percentages of dreams and nightmares which were found to contain varying levels of bizarreness. While approximately 65 percent of dreams possessed one or less bizarre occurrence (see Figure 6), and although there was a trend towards more bizarreness in nightmares (see Figures 7 and 8), 48 percent of "typical" nightmares, and about a third of subjects' "worst" nightmares showed very little of this cognitive aspect of sleep mentation. A comparison of these figures with Figures 1 through 4 illustrate the finding of a trend towards bizarreness in nightmares which is common to both scales.

Figure 9 displays the percentage of dreams and nightmares which possess particular items of bizarreness while Figure 10 is taken from the data reported by Strauch (1988). Note that the graphical depiction of bizarreness items in Figure 9 is virtually identical to that reported by Strauch (see Figure 10).

There was variation in the degree of bizarreness between

Figure nine. Percentages of dreams and nightmares evidencing bizarreness types.

Figure ten. Percentages of dreams evidencing bizarreness types as reported by Strauch (1988).

subjects. In the present sample of 43 individuals, 15 evidenced bizarreness in all of their reports. In contrast, six subjects each reported a maximum of one bizarre occurrence across the three sleep mentation reports (i.e., "worst" nightmares, "typical" nightmares, and dreams).

A correlation matrix was calculated for the CUSI and is shown in Table 5. As expected, strong positive correlations were found between bizarreness and dream length; however, even stronger positive correlations were found between realism and dream length. These strong correlations can be used to explain the seemingly contradictory, positive correlations between realism and bizarreness.

As bizarreness was found to be highly correlated with word count (i.e., dream length), the location of the bizarreness scores within the sleep mentation reports was examined to determine whether bizarreness was greater at a given location of the report - possibly at the end of a report. Each report was divided into equivalent thirds based upon word count with the corresponding bizarreness score being placed within the appropriate third. One-way repeated ANOVAs failed to show any statistically significant

Table 5

Pearson_r Correlations

	Variables												
	SL	DR	AN	BDI	DReal	TReal	WReal	DBiz	TBiz	WBiz	DWC	TWC	WWC
Sleep Length	1												
Dream Recall	--	1											
Nmare ^a Freq.	--	.447	1										
BDI ^b	--	--	.419	1									
Dream Realism	--	--	--	--	1								
Typical Nmare	--	--	--	--	--	1							
Realism													
Worst Nmare	--	--	--	--	--	--	1						
Realism													
Dream Biz. ^c	-.167	--	--	--	.499	--	--	1					
Typical Nmare	-.194	--	--	--	--	.429	--	--	1				
Biz.													
Worst Nmare	-.324	--	--	--	--	--	.249	--	--	1			
Biz.													
Dream Word	--	--	--	--	.856	--	--	.773	--	--	1		
Count													
Typical Nmare	--	--	--	--	--	.865	--	--	.737	--	--	1	
Word Count													
Worst Nmare	--	--	--	--	--	--	.892	--	--	.484	--	--	1
Word Count													

Note. ^aNightmare; ^bBeck Depression Inventory; ^cBizarreness

differences in the distribution of bizarreness scores within dreams, "typical" nightmares, or "worst" nightmares: $F(2, 84) = 3.05, p = .052$, $F(2, 84) = .69, p = .503$, $F(2, 84) = 2.60, p = .080$, respectively.

The hypothesis that bizarreness would be greatest in subjects' "worst" nightmares, in the middle for "typical nightmares", and least in subjects' "dreams" was examined using a one-way repeated ANOVA. The converse of this hypothesis, that the frequency of realistic occurrences would be greatest in "dreams", in the middle for "typical nightmares", and least in "worst nightmares" was also examined using a one-way repeated ANOVA. However, it was essential to control for the known relationship between bizarreness and word count before the ANOVAs were computed.

Recall that previous research has also concluded that word count (dream length) is a covariate of bizarreness (Hunt et al., 1982; Hobson, 1987; Porte & Hobson, 1986). Dreams were found to be significantly shorter than both "typical" and "worst" nightmares ($F(2, 84) = 8.329, p = .0005$), but the nightmare "types" were very similar in length. Therefore, the relationship between bizarreness/realism and word count was manipulated by holding word count constant. To facilitate comparison of results from the

present study with those of previous research, it was decided to compute bizarreness and realism densities (score/word count). These densities were then subjected to one-way ANOVAs and interestingly, there were no significant differences in bizarreness ($F(2, 84) = 1.85, p = .163$) or in realism ($F(2, 84) = 2.68, p = .074$). A comparison between the bizarreness densities found in the present study and those reported by Porte and Hobson (1986) was intended, however, only one of 129 reports in the current study surpassed Porte and Hobson's bizarreness density of .26.

A principal components factor analysis using orthogonal transformation to a simple structure was performed on a number of measures (see Table 6). The first factor (accounting for 29% of the explained variance) included dream realism and dream bizarreness and was labelled a dream factor. The second factor (20% of variance) was labelled a nightmare factor. Note that both the "typical" and "worst" nightmares loaded on this factor. The third factor (12% of variance) was labelled a frequency/recall factor.

Nightmares and Sexual/Physical Abuse

Eleven women and one man reported a history of sexual and physical abuse (mean age was 19; approximately 12 percent of

Table 6

Factor Matrix for Principal Components Analysis

Varimax Factor Matrix			
(orthogonal rotation to a simple structure)			
n=43			
	factor 1	factor 2	factor 3
Dream Recall	-.21	-.11	.69
Adult Nightmare Frequency	.02	-.06	.84
BDI	.01	.14	.71
Dream Realism	.79	.26	-.05
Typical Nightmare Realism	.54	.57	-.11
Worst Nightmare Realism	.10	.79	.00
Dream Bizarreness	.85	-.13	-.12
Typical Nightmare Bizarreness	.43	.57	.20
Worst Nightmare Bizarreness	-.05	.65	-.04

sample), while five women and four men reported a history of physical abuse only (mean age was 19; approximately nine percent of sample). Due to the small size of the sexually abused and physically abused groups, it was decided to collapse the groups on sex. A control (non-abused) group was formed by matching age (mean age was 19) with the sexually and physically abused groups; the control group was matched on sex with the sexually abused group only because of the limited group sizes.

To examine findings from previous research (Cuddy, 1990, for example) that the groups would differ on measures such as depression and nightmare frequency, a number of one-way ANOVAs were computed (see Table 7). An exploration of bizarreness between the groups was also undertaken; however, no statistically significant findings were uncovered (see Table 8). Chi square analyses revealed no differences in the frequency distributions of bizarreness at the five levels of the CUGRS for dreams ($X^2 = 8.56$, $df = 8$, $p = .38$), "typical" nightmares ($X^2 = 9.05$, $df = 8$, $p = .34$), and "worst" nightmares ($X^2 = 7.34$, $df = 8$, $p = .50$).

Table 7

Group Comparisons (one factor ANOVAs)

Variables	Groups					
	Physical Abuse		Sexual Abuse		Control	
	mean	SD (n=9)	mean	SD (n=12)	mean	SD (n=12)
Dream Recall	3.56	1.33	3.50	1.24	3.50	1.24 F=.006 NS
Adult Nightmare Frequency	3.00	1.12	2.75	0.62	2.33	0.88 F=1.58 NS
Adolescent Nightmare Frequency	2.78	0.66	2.67	0.88	2.75	0.62 F=.067 NS
Child Nightmare Frequency	2.78	0.97	3.25	1.05	2.83	0.72 F=.882 NS
Repetitive Nightmare Frequency	1.33	0.71	1.58	0.79	1.41	0.90 F=.968 NS
BDI	12.44	8.85	12.67	7.15	8.67	7.50 F=.264 NS

Table 8

Group Comparisons for Bizarreness and Realism Densities (one factor ANOVAs)

Variables	Groups									
	Physical Abuse					Sexual Abuse				
	mean	SD	n	mean	SD	n	mean	SD	n	Control
Dream Realism	.360	.100	6	.260	.060	7	.265	.071	9	F=3.4 NS
Dream Bizarreness	.01	.024	6	.035	.033	7	.028	.048	9	F=.73 NS
Typical Nightmare Realism	.313	.258	8	.243	.041	9	.224	.107	11	F=.88 NS
Typical Nightmare Bizarreness	.092	.094	8	.035	.024	9	.068	.088	11	F=.31 NS
Worst Nightmare Realism	.238	.099	8	.274	.080	12	.233	.067	12	F=.87 NS
Worst Nightmare Bizarreness	.045	.025	8	.034	.024	12	.038	.031	12	F=.58 NS
Dream Word Count	27.17	16.46	6	67.29	71.06	7	38.56	25.87	9	F=1.3 NS
Typical Nightmare Word Count	86.75	105.52	8	76.44	58.30	9	97.80	102.71	11	F=.19 NS
Worst Nightmare Word Count	106.50	86.10	8	124.83	90.56	12	82.17	44.25	12	F=.39 NS

Discussion

There was no support for the hypotheses that "worst" nightmares would possess the most bizarreness and the least amount of realism. When the length of the reports was held constant there were no differences in bizarreness or realism between the two classes of sleep mentation reports (i.e., between dreams and nightmares). Thus, the nightmares in the present sample are not necessarily more bizarre or more realistic per unit measure than dreams, but they tend to be longer. Dream length (i.e., word count) has been found to be highly correlated with the level of bizarreness and realism in a sleep mentation report. Although this finding, that longer reports are more bizarre, is consistent with previous research (see Section 4.1) it has also been found that longer reports contain more realism. The cognitive aspect of dreams known as "bizarreness" cannot be used to differentiate dreams from nightmares.

This finding negates the traditional belief shared by some researchers, that nightmares are, by definition, "strange." Hunt (1989, p. 124) for example, states that nightmares are "dreams that are bizarrely fantastic and terrifying." Although on a

phenomenological level this may be correct, the implication, that nightmares are more bizarre than dreams, is confirmed only to the extent that nightmares are "bizarre dreams" because they tend to be longer and because bizarreness is positively correlated with dream length. It should be noted that this increase in bizarreness associated with longer sleep mentation reports is not localized within any particular portion of the report.

It was hypothesized that approximately one third of dreams and one half of nightmares would exhibit bizarreness. These figures were unexpectedly exceeded. While the percentage of dreams and nightmares which demonstrated bizarreness was greater than anticipated, it should be emphasized that the majority of dreams, almost half of "typical" nightmares, and about a third of "worst" nightmares contained one or less bizarre occurrence. A study by Strauch (1988) also reported that 64.1 percent of laboratory-recalled, REM dreams contained one or less bizarre occurrence per dream. The similar frequency found in the present sample of dreams confirms that the home-recall collection technique is a practical and valid collection method for the assessment of dream bizarreness. The types of bizarreness found in the present sample of

dreams and nightmares are also strikingly comparable to that reported by Strauch. This suggests that the types of bizarreness found in nightmares do not differ from the types found in dreams.

The expectation that the most common type of bizarreness would be unlikely or inappropriate events/objects was not confirmed. Bizarre action was found to be the most common bizarreness type, and interestingly bizarre affect was the least common. Recall that only two (1.55%) of 129 reports displayed any bizarre affect. This implies that the affective content of nightmares, traditionally conceived to be frightening, is rarely strange, inappropriate or uncertain.

Although there was general agreement between the CUSII and the CUGRS, the differences between the two measures support the notion that the scale used when attempting to gauge bizarreness influences the finding (see sections 4.4 & 4.5). The results obtained from the CUGRS indicated that both nightmare "types" evidenced significantly more bizarreness than dreams while the CUSII did not show any differences between dreams and nightmares when word count was controlled. The lack of any statistically significant differences between the "typical" nightmares and the "worst"

nightmares on various measures suggests that these may not be different "subtypes" of nightmares. Hence the repeated use of quotation marks throughout this study. The common loading of these nightmare "types" on a factor in the principal components analysis supports this suggestion. It is recommended that future research attempt to more adequately distinguish possible subtypes through some measure - possibly a measure of intensity.

Hunt (1989; Hunt et al., 1982), Starker (1973, 1974, 1977), and Strauch (1988) suggest that there may be individual variation in the amount of bizarreness reported by subjects. There is some support in the present study for the notion that the level of bizarreness differs between individuals and is a function of dreaming style. This holds particular relevance for Hobson's ASH given his controversial data set.

As explained in section 2.2, much of the foundation for the ASH is based upon the analysis of dreams obtained from one individual - the "Engine Man." The results from the present study, along with previous research, stress the importance of obtaining sleep mentation reports from a variety of individuals as the possibility exists that the "Engine Man" may have had a style of dreaming in

which bizarre occurrences were common. Hobson's use of one subject can therefore only be interpreted as a "faux pas" of research.

Returning to the discussion of section 2.0, the present study does not support the traditional psychoanalytic position that dreams are a psychosis with their attendant absurdities, delusions, and illusions. Indeed, the majority of dreams and approximately one-third to one-half of all nightmares possessed very little bizarreness. Freud's assumption that logical dreams were "fantasies" which occurred while the individual was awake is contradicted by the number of relatively mundane reports observed in this study. As mentioned in section 3.0, additional studies (E. Dorus et al., 1971; Giora, 1981; Hunt, 1989; Hunt et al., 1982) which have concluded that most dreams are not bizarre further restrict the application of traditional psychoanalytic theory.

The results of the present study are also inconsistent with the ASH. Approximately half of the dreams and nightmares showed minimal amounts of bizarreness as scored on the CUSII, and 56 percent of dreams and nightmares were rated as mostly realistic on the CUGRS. The finding that bizarreness is not a feature common to all sleep mentation reports all of the time is in agreement with the

results reported by E. Dorus et al. (1971), Giora (1981), Hunt (1989; Hunt et al., 1982), and Snyder (1970). The cognitive feature of bizarreness cannot be utilized as the sole mechanism which affirms the psychological implications of the activation-synthesis hypothesis. The notion of a sporadic and chaotic brain stem activation followed by inadequate cortical synthesis requires further revision.

A possible explanation for Hobson's (1988; Hobson et al., 1987) high rates of bizarreness reported in his work may involve the use of his scale. Section 4.5 has indicated that high rates of bizarreness are essential for confirmation of the ASH. Hobson et al. (1987) outline the use of their scale and it appears that they have repeatedly assigned similar or virtually identical bizarre occurrences to different bizarreness scores. For example, "none of which seemed large" (Hobson et al., 1987, p. 159) was assigned the bizarreness score of plot incongruity (A-2), and "seemed large" (taken from the identical clause) was assigned the bizarreness score of cognitive uncertainty (B-3). In the present study a bizarre occurrence was assigned only one score and was not broken down for further assignment. This discrepancy in scoring procedure may help

to explain Hobson's findings.

The exploration of possible group differences between sexually abused, physically abused, and nonabused individuals did not produce any notable findings. There were no differences in bizarreness between the sexually abused group, the physically abused group, and the control group. In addition, the rare occurrence of bizarre affect did not allow for an examination of possible group differences in the amount of emotion revealed. The small group sizes should be noted as this may have seriously limited this exploration. Furthermore, subjects' willingness to self-disclose possible traumatic experiences is an omnipresent concern and the number of individuals in the present study who reported abuse is below published figures (Cuddy, 1990; Russell, 1983). There are several other limitations to the present study which must be mentioned.

One possible criticism of the present study is that the use of home-recalled dreams precluded knowledge of the sleep stage in which the dream was experienced. However, it was outlined on page three that nightmares have been defined by the Sleep Disorders Classification Committee (1979) as occurring during the REM stage of sleep. Furthermore, as past research has found that home-

recalled dreams tend to be more bizarre than laboratory-recalled dreams (see section 4.2), the use of the laboratory-collection technique would have only contributed to a decrement in the amount of bizarreness reported.

Another possible criticism of the present study is the infrequent occurrences, and low inter-rater reliability figure, of the sudden/slow change dimension. It is recommended that this dimension be eliminated and that sudden/slow changes be subsumed within the impossibility dimension. This should further increase inter-rater reliability and simplify the scale.

One might speculate that a judge's rating may attribute more bizarreness to a sleep mentation report than is actually experienced by the subject. Only one study was located which has examined this phenomenological issue (Zepelin, 1989) and it was found that judges rated dreams as more bizarre than did subjects. This is an issue which future work must address. There exists other potential avenues which future research might consider worthwhile.

Having empirically criticized and evaluated the cognitive concept of bizarreness, the question remains as to why there exists variation in the amount of bizarreness reported and experienced by

individuals. Giora (1981) and Starker (1973, 1974, 1977) have supported the concept that there is a relationship between an individual's daydreaming style and nocturnal dreaming style. This suggests support for the continuity hypothesis which additional research may help elucidate.

Another question which remains to be addressed concerns the lack of recognition of bizarre elements in dreams. It appears that most people simply do not perceive the bizarre elements which occur in their dreams. Some investigators (Garfield, 1974; LaBerge, 1985; Tholey, 1983) have suggested that the noticing of dream bizarreness may be a precursor to dream lucidity with an orientation response to the oddity resulting in a lucid experience. Further investigation into this issue may prove fruitful.

Finally, reference to section 4.4 illustrates how the term "bizarreness" has been used in the past, and it is now suggested that the term "bizarreness" be replaced with "impossible/improbable". This is suggested because an "impossible/improbable" dimension immediately denotes reality, the "universal measuring-stick", and thus obviates the term "bizarre." It is felt that the use of this term more accurately reflects the purpose of this measure.

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Appendix A

A Scoring Manual for the Bizarreness of Dreams

Outline

Section 1.0 Dream Items

Definitions of dream items used in the quantification of dream bizarreness.

Section 2.0 Dimensions of Bizarreness

Description of dimensions of bizarreness and examples of bizarre items found in these dimensions.

Section 3.0 Examples of Dreams Content-Analyzed for Bizarreness.

The Carleton University Scale of Impossibilities and Improbabilities is used to analyze dream bizarreness.

Section 4.0 A Conceptual Model of Bizarreness.

A brief description of the conceptual model behind the Carleton University Scale of Impossibilities and Improbabilities.

Section 5.0 A Likert Scale for the Analysis of Dream Bizarreness.

A description of the Carleton University Global Realism Scale.

Section 1.0 DREAM ITEMS

Instructions to judges: Read entire dream once. Then consider each sentence in terms of the following properties:

(1) character	(5) speech
(2) setting	(6) thoughts
(3) action	(7) affect
(4) event/object	

...where each above item is defined as the following:

1) Character - an animate element of the dream; some dream actor; creations of animals or persons within the dream which are considered so credible that they exist for the dreamer.

There may be more than one character in a sentence in which case each character would be rated separately. In the event of one character (eg., "my aunt") and a group of characters collapsed as a collective unit ("my friends") the "friends" would be given one rating and the "aunt" would also be given one rating. Also each character will be rated upon each occurrence; i.e., if character "x" occurs in both sentences "a" & "b" then character "x" will be rated in each sentence. This is done because character "x" may change either within or between sentences.

2) Setting - background against which the action of a narrative

takes place. Elements of a setting are:

- i) geographical location, its topography, scenery, and such physical arrangements as the location of the windows and doors in a room
- ii) the time or period in which the action takes place, eg., epoch in history, season of the year, etc.
- iii) the general environment of the character(s) eg., religious, mental, moral, social, and emotional conditions through which the people in the dream move.

In the event that there is more than one setting in a sentence, each setting shall receive a separate rating.

3) Action - an exertion of energy, power, force. Passive (eg., "I was sitting") and active verbs (eg., "I ran across the lawn") are considered to represent action. There may be more than one action per sentence in which case each is rated separately. In the event that an action and setting are difficult to distinguish, for example, "I was sitting at a large, oak table," score "was sitting" as an action and score "large, oak table" as setting.

4) Event/Object - is an occurrence (i.e., a "thing" in an abstract sense) or a material item (i.e., an inanimate dream element). For example, a "meeting" is an event whereas a "screwdriver" is a dream

object. In the event of more than one event/object per sentence, each object shall be rated separately.

5) Speech - is defined as a particular utterance performed by a dream character or object. Typically, dream speech will be carried out by characters. In the event of more than one item of speech per sentence, or speech by more than one character or object per sentence, each shall be rated separately. Any speech which occurs in the dream will be rated as speech only and will not be considered as action.

6) Thoughts - considered to be any mental activity of the dreamer or dream character occurring within the dream. The distinction between speech and thought may be indicated within the dream. Once again, more than one occurrence of thought per sentence is to be rated separately.

7) Affect - is defined as any emotion occurring within the dream. For example, I felt horrified, happy, sad, etc. More than one emotion per sentence is to be rated separately.

Section 2.0 DIMENSIONS OF BIZARRENESS

Following the identification of each of the above items, place

each into only one of the following dimensions:

- A) Impossible
- B) Change in Item - sudden or slow
- C) Improbable
- D) Uncertain
- E) Realistic

See below for more detailed descriptions of these categories. Remember to counterbalance the order between this scale and the Likert scale (see Section 5.0). Also, it is important that rating sessions last only one hour, or ten dreams in length, whichever comes first.

A) Impossible: Impossible denotes a violation of natural laws of reality (i.e., a violation of space, time, and causality) - dream elements which are beyond human capacity for experience. Temporal displacements are also included in this category. The following items are placed in this category and are classified as indicated in parentheses: character (A-1); setting (A-2); action (A-3); object (A-4); speech (A-5). Note that cognitions and affect are not included in this category as they are inappropriate/improbable and not impossible. Here are some examples...

Impossible character (A-1) - "...a monster-like being from the depths of the ocean..."

Impossible setting (A-2) - "...I was in ancient Rome preparing for battle..."

Impossible action (A-3) - "...I found that by flapping my arms real hard I was able to fly through the air..."

Impossible object (A-4) - "...and she pointed a disintegrator ray-gun at me..."

Impossible speech (A-5) - "...the tree asked me if I was willing to play a few holes of golf with it..." Note that all dream utterances will be rated as speech and not action.

B) Change in Item - Sudden or Slow: Items considered to be sudden or gradual changes/alterations in each of the dream items. This dimension will be treated differently from the other dimensions. In particular, a change may occur within any of the other dimensions; i.e., a change may be impossible, improbable, vague/uncertain, or realistic and may occur in any of the dream items. Slow changes differ from sudden changes only in the speed with which the change occurs. Slow changes will be assigned a "1" in addition to the category; that is, while a sudden change in impossible setting would be assigned the B-2 category, a slow

change in impossible setting would be assigned B-2-1. The speed of the change will be indicated within the dream. If the speed is not indicated or is vague then the rater will assume that it is a sudden change.

Sudden change in impossible character (B-1) - "...and then right before my eyes the Martian became a Venetian..."

Sudden change in impossible setting (B-2) - "...I walked out of my spaceship only to find myself walking inside a live volcano..."

Sudden change in impossible action (B-3) - "...I walked right into the cloud when I realized that I was now walking on the bottom of the ocean..."

Sudden change in impossible object (B-4) - "...the disintegrator ray-gun turned into a molecular disruptor device..."

Sudden change in impossible speech (B-5) - "...when the tree stopped interrogating me it then began to scream..."

Note that all dream utterances will be rated as speech and not action.

Sudden change in improbable character (B-6) - "...while I was standing on the sidewalk watching the fire I noticed Pierre Trudeau

was standing beside me on one side and Brian Mulroney was on the other. But then Pierre Trudeau turned into Marc Lalonde and Brian Mulroney changed into Joe Clark..."

Sudden change in improbable setting (B-7) - "...I was playing soccer with some friends on a baseball diamond when all of a sudden we were then playing on a football field..."

Sudden change in improbable action (B-8) - "...while playing tennis I kicked at the tennis ball once but then found a racquet in my hand so I hit the ball with the racquet."

Sudden change in improbable object (B-9) - "...I opened my dresser drawer and found a bowl of salad which turned into a bowl of soup..."

Sudden change in improbable speech (B-10) - "...the pope was screaming and cursing, going on and on when he just stopped and asked me, "How are you today?"

Sudden change in improbable thought (B-11) - "...while in algebra class I began to think of Dumas' Twenty Years After when suddenly I started thinking of complex arithmetic formulas."

Sudden change in improbable affect (B-12) - "...all of a sudden it dawned on me that laughter was not suitable at a funeral so I

found myself crying."

Sudden change in uncertain character (B-13) - "...I thought it was my uncle but then the figure changed and it looked like my aunt's brother..."

Sudden change in uncertain setting (B-14) - "...it seemed to be the local mall but then everything changed and I no longer recognized the stores."

Sudden change in uncertain action (B-15) - "...it appeared as if she was going to speak when she suddenly appeared to make gestures with her head."

Sudden change in uncertain object (B-16) - "...it could have been a red sports car when it suddenly looked like a fire truck but I really couldn't tell what it was."

Sudden change in uncertain speech (B-17) - "...she seemed to ask me, 'How are you?' when all of a sudden I heard something like 'Low tofu diet.'"

Sudden change in uncertain thought (B-18) - "...I was thinking about either my Italian exam or my Latin exam when suddenly my mind started to wander and I thought about writing utensils, paper,

and an assortment of other things."

Sudden change in uncertain affect (B-19) - "...I wasn't sure if I was happy or sad but all of a sudden it appeared as if I was angry but I can't be certain."

Sudden change in realistic character (B-20) - "...I opened the door to see my friend when right before my eyes she changed into my cousin."

Sudden change in realistic setting (B-21) - "...I was standing in my bedroom when I suddenly found myself in Hamilton."

Sudden change in realistic action (B-22) - "...I was running after the soccer ball when all of a sudden I was walking after it."

Sudden change in realistic object (B-23) - "...the ball turned into a bat."

Sudden change in realistic speech (B-24) - "...she responded, 'The gravy is not on the table.' and then asked, 'Did you see the lunar eclipse last year?'"

Sudden change in realistic thought (B-25) - "...I thought about the summer weather when the extreme cold of winter popped into my mind."

Sudden change in realistic affect (B-26) - "...I was extremely hurt and found myself crying when I realized that I was not at fault and I felt much anger and hostility."

C) Improbable: Items considered improbable are those which are inappropriate (features out-of-context) and/or are unlikely to occur but are not beyond the human capacity for experience. This dimension includes: character (C-1); setting (C-2); action (C-3); object (C-4); speech (C-5); thought of dreamer or dream character (C-6); and affect (C-7).

Improbable character (C-1) - "...while I was standing on the sidewalk watching the fire I noticed that Pierre Trudeau was standing beside me on one side and Brian Mulroney was on the other..."

Improbable setting (C-2) - "...I was playing soccer with some friends but we were playing on a football field..."

Improbable action (C-3) - "...while playing tennis I attempted to return the ball by kicking it..."

Improbable object (C-4) - "...I opened my dresser drawer and found a bowl of salad..."

Improbable speech (C-5) - "...I noticed that she was wearing a watch so I walked up to her and asked her the time. She replied, "What is time anyway? Does anyone really know what time it is?"

Improbable thought (C-6) - "...while in algebra class I began to think of Dumas' Twenty Years After..."

Improbable affect (C-7) - "...while at the funeral I began to laugh..."

D) Uncertainty/Vagueness/Confusion/Clouding: The dream items are rather unclear (either as reported by dreamer or as experienced within dream), vague, confusing, etc. Character (D-1); setting (D-2); action (D-3); object (D-4); speech (D-5); thought of dreamer/dream character (D-6); and affect (D-7).

Uncertain character (D-1) - "...I thought it was my uncle but I really wasn't sure..."

Uncertain setting (D-2) - "...it appeared to be the lobby of the university library but things just weren't right..."

Uncertain action (D-3) - "...I wanted to raise my right arm but I didn't know how or why..."

Uncertain object (D-4) - "...it looked like my red shirt but

something about it was different..."

Uncertain speech (D-5) - "...she was asking me about my career goals when she mumbled something entirely unintelligible..."

Uncertain thought (D-6) - "...I was thinking about my English essay but the topic was that of my history paper - it all seemed rather confusing to me..."

Uncertain affect (D-7) - "...I was sad and crying yet at the same time I felt happy and I can't understand why..."

E) Realism: An item is identified as realistic if it is true to daily life - either a replication of a previous experience or is within the capacity for human experience in general - and is appropriate within the context of the dream. Realistic character (E-1); setting (E-2); action (E-3); object (E-4); speech (E-5); thoughts (E-6); and affect (E-7).

Realistic character (E-1) - "...my sister came to see me at my graduation..."

Realistic setting (E-2) - "...I was at my parents home and we were sitting on the back porch..."

Realistic action (E-3) - "...during a baseball game I was throwing

the ball to the shortstop in an attempt to cut off the runner..."

Realistic object (E-4) - "...I reached in my pocket for my pen - it was the pen I had received as a gift and was my favourite..."

Realistic speech (E-5) - "...my cousin spoke in a clear, assertive voice, 'Now, you have to understand why it was done.' he stated..."

Realistic thoughts (E-6) - "...I thought it was time for dinner so I glanced down at my watch to find that I was right. I was then forced to consider a suitable restaurant for my meal..."

Realistic affect (E-7) - "...the comedian was extremely talented and I found myself laughing and feeling quite calm and happy..."

SECTION 3.0 EXAMPLES OF DREAMS CONTENT-ANALYZED FOR BIZARRENES

The following three sleep mentation reports have been randomly selected and illustrate how this scale shall be used to content-analyze dreams for bizarreness:

- 1) A more typical nightmare, which occurs seldomly [sic], is one in which a close friend or even just an acquaintance has an accident and is injured. His/Her injuries do not involve blood. They involve mainly broken limbs or paralysis and once death. I have chosen to record this particular dream because it is one I always to recall [sic]

the next morning, and one I find strange for the accidents themselves are tragic, yet the injuries are usually broken limbs, and none of the people I dreamt about have been in an accident nor do they have broken limbs.

sentence: "A more typical...is injured."

"close friend or acquaintance" - E-2 (realistic character)
 "accident" - E-5 (realistic object)
 "is injured" - E-4 (realistic action)

"His/Her injuries do not involve blood."

"His/Her" - E-2 (realistic character)
 "injuries" - E-5 (realistic object)
 "blood" - E-5 (realistic object)

"They involve...death."

"broken limbs" - E-5 (realistic object)
 "paralysis" - E-5 (realistic object)
 "death" - E-5 (realistic object)

Likert rating: 1

2)

The dream starts off in total blackness. I feel I am in a dark corridor and I am walking. Suddenly, I notice a door (I can see the light behind it shining through the cracks around the door). I open the door and I find myself in a blinding white room. I cannot see any walls in this room nor a ceiling. However, I do see a

chair in the middle of the room. Above the chair is a rope hanging down with a sheet over a figure. I walk up to the chair and I grab on to the sheet and I rip it off the figure, only to notice the figure is myself. Then the dream ended.

sentence: "The dream...blackness."

"total blackness"

- C-3 (improbable setting)

"I feel...walking."

"I"

- E-2 (realistic character)

"feel...(dark corridor)"

- D-3 (uncertain setting)

"am walking"

- E-4 (realistic action)

"Suddenly, I notice...door."

"Suddenly, (I notice a door)"

- B-19 (sudden change in uncertain setting)

"I"

- E-2 (realistic character)

"notice"

- E-4 (realistic action)

"door"

- E-5 (realistic object)

"can see"

- E-4 (realistic action)

"light"

- E-5 (realistic object)

"shining through"

- E-4 (realistic action)

"cracks"

- E-5 (realistic objects)

"I open...room."

"I"

- E-2 (realistic character)

"open"

- E-4 (realistic action)

"door"

- E-5 (realistic object)

"blinding white room"

- B-19-1 (slow change in uncertain setting)

"I cannot...ceiling."

"I"

- E-2 (realistic character)

"see"

- E-4 (realistic action)

"cannot see any walls in this room nor a

ceiling"

- C-3 (improbable setting)

"However, I...room."

"I"

- E-2 (realistic character)

"do see"

- E-4 (realistic action)

"chair"

- E-5 (realistic object)

"room"

- C-3 (improbable setting)

"Above...figure."

"chair"

- E-5 (realistic object)

"rope"

- E-5 (realistic object)

"hanging down"

- E-4 (realistic action)

"sheet"	- E-5 (realistic object)
"figure"	- E-5 (realistic object)
"I walk...myself."	
"I"	- E-2 (realistic character)
"walk"	- E-4 (realistic action)
"chair"	- E-5 (realistic object)
"grab"	- E-4 (realistic action)
"sheet"	- E-5 (realistic object)
"rip"	- E-4 (realistic action)
"figure"	- E-5 (realistic object)
"notice"	- E-4 (realistic action)
"myself"	- A-2 (impossible character)

Likert rating: 5

3)

It's a coincidental meeting with Mr. Right. He wined and dined me and took me travelling around the world. We met because I came home one day to find a stranger in my home. Thinking that it was a robber, I bashed him over the head with an antique vase in my house when my mother told me that he was a house guest for a few days. I felt guilty and stayed up all night waiting for him to wake up, I had fallen asleep. When I woke up, he

was gone (It then skips over to when we meet for dinner and we go to Australia and Cape Cod and that's all I remember).

sentence:

"It's...Mr. Right."

"meeting"

- E-5 (realistic
object)

"Mr. Right"

- E-2 (realistic
character?)

"He...world."

"He"

- E-2 (realistic
character)

"wined"

- E-4 (realistic
action)

"dined"

- E-4 (realistic
action)

"me"

- E-2 (realistic
character)

"travelling"

- E-4 (realistic
action)

"world"

- E-3 (realistic
setting)

"We...home."

"We"

- E-2 (realistic
characters)

"met"

- E-4 (realistic
action)

"I"

- E-2 (realistic
character)

"home"

- E-3 (realistic
setting)

"to find"

- E-4 (realistic
action)

"stranger"

- E-2 (realistic
character)

"Thinking...asleep."

"Thinking...(robber)"

- E-7 (realistic
thought)

"robber"

- E-2 (realistic
character)

"I"

- E-2 (realistic
character)

"bashed"

- E-4 (realistic
action)

"him"

- E-2 (realistic
character)

"head"

- E-5 (realistic
object)

"vase"

- E-5 (realistic
object)

"house"

- E-3 (realistic
setting)

"mother"

- E-2 (realistic
character)

"told me...(guest for a few days)"

- E-6 (realistic
speech)

"felt guilty"

- E-8 (realistic
affect)

"stayed up"

- E-4 (realistic
action)

"night"

- E-5 (realistic
object)

"had fallen asleep"

- E-4 (realistic
action)

"When I...gone."

"I"

- E-2 (realistic
character)

"woke up"

- E-4 (realistic
action)

"he"	- E-2 (realistic character)
"was gone"	- E-4 (realistic action)
"(It then...Cape Cod...)"	
"skips"	- B-27 (sudden change in realistic setting)
"we"	- E-2 (realistic characters)
"meet"	- E-4 (realistic action)
"dinner"	- E-5 (realistic object)
"Australia"	- E-3 (realistic setting)
"Cape Cod"	- B-27 (sudden change in realistic setting)

Likert rating: 2

Section 4.0 A CONCEPTUAL MODEL OF BIZARRENESS

The Carleton University Scale of Impossibilities and Improbabilities (CUSII)

An inverted pyramid can be used to represent the model with which dream bizarreness will be considered. Impossibilities, which are at the bottom of the inverted pyramid, are universally accepted as representing dream bizarreness and as such form the foundation, or core, of this scale. Improbabilities and uncertainties (clouding,

vagueness, confusion, etc.) are other common dimensions of bizarreness but are not intrinsically bizarre/strange and thus are placed on a different level than impossibilities. Unlike most other bizarreness scales, this scale will also be utilized to determine the realism of dreams. It is believed that a measure of bizarreness and realism in dreams will more accurately reflect how cognitively strange or weird dreams truly are. Finally, sudden or slow changes (gaps, scene shifts, etc.) permeate the pyramid as change may be impossible, improbable, uncertain (i.e., confusing) or realistic.

SECTION 5.0 A LIKERT SCALE FOR THE ANALYSIS OF DREAM BIZARRENESS

Carleton University Global Realism Scale (CUGRS)

This is a 5-point Likert scale which is used to rate the overall realism/novelty of a dream. The judge reads the entire dream and assigns the dream to the corresponding category.

Assign a score of ONE - entirely realistic/true to daily life - the events of the dream are a replication of a previous experience or are within the capacity for human experience in general.

Eg. "I returned to my car to find that I had locked the keys

inside."

Eg. "A friend and I went to see the movie 'Rainman.' I really didn't feel like going for some reason but I went anyway. After the film we went for a coffee and talked about the movie. We then returned to the car - it was my friend's car and she was driving of course. All of a sudden a man, who was brandishing a baseball bat, appeared and smashed the driver's side window. He then proceeded to pull my friend from the car. I ran screaming from the car in a desperate attempt to find help."

Assign a score of TWO - mostly realistic/true to daily life - the events of the dream have been previously experienced, or may be experienced in the future (i.e., they resemble waking experience) but the dream contains minor novelty or minor improbabilities.

Eg. "I was speaking with some friends about the movie. I remembered that it was really Tuesday and not Wednesday."

Eg. "It all happened in New York city. The streets were really busy and there were many people on the sidewalks. I was walking down the street to get to the subway and although I have been to New York and I do remember this particular street, I have never attempted to ride the subway there."

Assign a score of THREE - somewhat realistic/true, somewhat unrealistic/untrue - events in the dream either have been or could be experienced but the dream contains novelty and/or improbabilities.

Eg. "I was walking down the street talking to a friend, but I really don't recognize where this happened or when."

Eg. "Driving the car in the mountains of British Columbia was a fascinating and different experience. I was driving up a steep hill but there was no power in the motor - the car was slowing down. At this point the passenger - a woman I don't recognize - said that 'I should get out and push.' Of course I did this but when I got out she jumped in the driver's seat and took off with the car."

Assign a score of FOUR - mostly unrealistic/untrue - contains mostly novel and improbable events.

Eg. "I was outside on the front lawn when a dog, which had a newspaper in its mouth, walked up to me, dropped the newspaper at my feet and then left. Following this a little man about 4 feet tall walked up to me and asked me if I had any pipe tobacco handy. After I replied that I had none he asked me if I knew how long it would take to walk to Baffin Island."

Eg. "I was at the supermarket when a rude individual bumped

me with a shopping cart, refused to apologize and then proceeded on her way. Following this, another individual did the exact same thing. I immediately went up to this man and punched him in the face. Feeling contented with myself I went to have a beer. When I reached the bar a sign on the door read, 'Closed until December 1, 1991'. I knew that something was strange because it was only the year 1989."

Assign a score of FIVE - entirely unrealistic/untrue - never previously experienced and impossible to be experienced.

Eg. "I was flying around my block by flapping my arms. My family and all of my neighbours applauded as I performed myriad aerial acrobatics."

Eg. "I was swimming across the pacific ocean when suddenly I was swallowed by a huge whale. While inside the whale I explored its digestive system. After a thorough exploration I decided it was time to leave so I built a small fire. Not a big one - just a small one so that the whale wouldn't be hurt but would spit me out because of the irritation. Then I found myself on a beach in France and I knew where I was. It was Dieppe back in 1942 and I was one of the Canadian forces attacking the Germans. I was hit by a bullet and I

was just about to die when I awoke."

Appendix B

The following set of questions are designed to obtain information regarding people who have nightmares. Please fill out the questionnaire to the best of your ability. In answering the questions, please place a slash "/" in the most appropriate location on each of the scales (i.e., question 1) and a checkmark in the blank space when you need to indicate which of a series of answers is correct.

1. Please use a "/" to show how much sleep you get during an average night.

2. During an average month, how many times do you wake up in the morning recalling any kind of dream? Mark the most correct answer.

- ___ 0 times per month
- ___ 1 to 3 times per month
- ___ 4 to 10 times per month
- ___ 11 to 20 times per month
- ___ 21 to 25 times per month
- ___ 26 times per month or more

3. In the past year, how often have you experienced nightmares?

___ 0 (never)

___ 1 to 2 times per year (very seldom)

___ 3 to 12 times per year (up to once a month)

___ 2 to 5 times per month (up to once a week)

___ once a week or more

END

1|5|0|4|9|1

FIN