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THE EDUCATION OF ATTENTION TO
DREAMING IN HIGH AND LOW
FREQUENCY DREAM RECALLERS:
the effects on dream
self-reflectiveness lucidity and control
by

SHEILA PURCELL, M.A.

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of
Doctor of Philosophy

Department of Psychology

Carleton University

Ottawa, Ontario

submitted September, 1987

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ABSTRACT

Theory based upon experimental dream research has been constructed within certain limits which have become too constraining to account for recent findings such as dream lucidity and control. These limits are framed in terms of dream isolation from waking consciousness, and the dream suspension of self-regulatory functions. A main thesis of this research is that these limits have been inferred from a narrow data-base using inadequate instrumentation. Two studies were performed in order to reassess dream isolation and self-regulation while dreaming.

Study 1 applied a Dream Control Scale developed to investigate this capacity, to 424 dreams of 48 psychology undergraduates to collect normative and reliability data. It was found that the average dream exhibited moderate levels of intentional behavior; that spontaneous dreaming ranged from having no control in the dream to lucid control over aspects of the dream generation process; and that this process was significantly enhanced through learning during the waking state, notably through the learning of lucidity.

Study 2 replicated and extended Study 1 by evaluating both dream control and dream self-reflectiveness (which includes self-reflective awareness of state, or lucid dreaming). Ninety-four psychology undergraduates were selected for gender and high or low dream recall frequency and were randomly assigned to three treatment conditions: a

Baseline condition requiring 3 weeks of uninstructed dream report writing; an Attention-control condition which had weekly meetings with the experimenter to instruct them in detailed dream reporting; and a Schema condition wherein subjects additionally learned waking cued schema rehearsal to develop lucid dreaming and dream control. It was found that lucidity, dream self-reflectiveness and dream control were significantly increased over Baseline levels through waking entrainment of attentional and intentional processes. It was also demonstrated that subjects who responded maximally to Schema treatment found certain effects on subsequent waking cognition/experience. Finally it was found that Baseline differences between high and low frequency recallers in dream self-reflectiveness and control were attenuated in the Schema condition as both high and low recallers reorganize their habits of attention to dreaming more similarly.

It was concluded that dreaming is not isolated from waking but that demonstrable transfer effects from waking to dreaming and from dreaming to subsequent waking occur. Additionally it was shown that differences between high and low frequency recallers are partially due to differences in habits of attention which respond to learning and reorganization. This demonstration involved the dream self-regulatory processes of noticing and acting, and are related to similar processes in waking self-regulation.

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INTRODUCTION

Theories of dreaming prior to 1953 and extending back over the centuries have supported every form of extravagance in terms of what it is possible to do in dreams. The sleep/wake boundary has often been seen as a magic curtain across which lies certain knowledge of the future, of the universe, of the Truth. The advent of the sleep laboratory and the discovery of REM sleep were milestones in the grounding of dream theory within scientific methodology. There are now theories of dreaming which are based on a large body of systematically collected empirical data. Unfortunately, in countering the magic curtain effect and the indulgences of pseudo-science, current academic dream theory is more than just conservative. It has regularly reduced dreaming to a 'nothing-but' phenomenon, and at its most expansive, defines dreaming in terms of limits not shared by normal waking consciousness. These limits, largely framed as dream isolation and suspension of self-regulatory functions, have become overly constraining in the light of new findings for which present theories cannot account.

This research project elects to train subjects in two forms of meta-cognition which are traditionally and regularly seen as non-operative in dreaming to various degrees. These are dream self-reflectiveness, including lucid dreaming, and dream control or intentional dreaming. Most of the research germane to these dream processes and

their relations to waking processes are less than a decade old.

The most pertinent of this research for the present work are two experiments by Purcell, Mullington, Moffitt, Hoffmann and Pigeau (1986), which are partially replicated and extended in this project. Purcell and her colleagues dealt with dream self-reflectiveness as a continuous rather than a dichotomous variable (i.e. lucid and non-lucid). They found that the self-reflectiveness of normative dreaming appears to be canalized to certain intermediate levels even though higher levels, including lucid dreaming, spontaneously occur. In addition, the learning of relevant attention patterning schemas during normal waking consciousness was found to be sufficient to further organize a self-reflective process during dreaming in accordance with Rossi's (1972) theory of self-reflectiveness.

One reason for dreaming to be seen as cognitively deficient is a predominance of attention on the average dreamer in the context of a culture which places little value on dreams. There has been a tendency to theorize about the mean rather than about the variation, a trend which can overly limit theory. The strategy used in the present research is to study certain dream processes as a function of the extremes of dream recall frequency, and thereby encounter more of the range of the phenomena under investigation.

Purcell et. al. (1986) found that high frequency dream recallers had dreams with higher self-reflectiveness scores than low frequency recallers across all sleep stages in a baseline condition. The question then arises as to how this individual difference variable differentially affects response to the attentional schemas which increase the organization of dream self-reflectiveness. Also, since lucid dreaming and dream control co-occur in the anecdotal and experimental literatures, and each appears to be maximal in the presence of the other, an instrument which measures dream control is needed to investigate similar manipulations of dream control from normal waking consciousness.

As a result of certain limitations in the Purcell study, and of the questions raised by its findings, some pilot research has been done as well as a large scale experiment which address these issues. Chapter 1 reviews the theory and research on how dream experience has been viewed and measured which converges on these questions. Chapter 2 presents a dream control scale developed by the author and applied to the 425 dreams from the original experiment 2 reported by Purcell et. al. (1986). Chapter 3 is a review of the research literature which bears on the effects individual differences in recall frequency and gender might have on baseline and manipulated levels of dream self-reflectiveness and control. Chapter 4 presents an experiment in which both dream control and self-

reflectiveness are investigated as a function of gender and the extremes of dream recall frequency. Baseline, attention-control and experimental groups are designed with a high N strategy to accomodate adequately the experimental and individual difference variables.

"Dreaming represents, I think, the most audacious and ingenious of nature's tricks for educating her psychologists."

Humphrey, 1983, p. 84.

CHAPTER I

The focus of this research is the dream ego's capability for two kinds of meta-cognition, or, 'thinking about thinking' (Kitchener, 1983). In meta-cognition, one level of thought is nested within another level. The first type under investigation here is dream self-reflection or, 'self thinking about self' wherein one takes one's self or an aspect of one's self such as one's mental processes as an object of awareness. The most meta-cognitive dream self-reflection found in the dream literature is 'awareness of dreaming while dreaming' and even, 'noticing noticing dreaming while dreaming', usually referred to as lucid dreaming. In this case, the dreamer takes his entire state of consciousness as an object of awareness.

An important conative vector which can culminate in lucid dreaming is that of volition or dream control. When this ability is 'noticed' by the dreamer within the dream, lucidity is triggered (Garfield, 1974). It can be seen as a type of self-reflectiveness (Rossi, 1972) because mental processes themselves are the object of awareness. It is also a form of meta-cognition in its own right if the conative/behavioral aspect is what is stressed. Therefore,

the second type of meta-cognition of interest here is 'controlling dreaming while dreaming'. Dream control may occur in the presence of lucidity or it may not. The following dream is an example of lucid control.

"I dreamed I was having dinner with a rather uptight group of psychologists when a woman across the table suddenly started recriminating with me for leaving the world of the academic elite and lowering my standards to those of the Sunday newspapers. I protested that this was an exaggeration and that I believed that the layman was entitled to at least some of our ideas, especially as he was paying for our research. At this she literally spat across the table that I was bringing the whole profession into disrepute, that we must maintain some vestige of authority, and so on. My fury rose to such a pitch that I had an irresistible desire to beat her up, and no sooner had I become aware of this desire than I realized with the utmost clarity that I was dreaming and could do exactly what I wanted because dream bodies cannot get hurt.

"So leaning across the table, I grabbed her by the hair, punched her face, and knocked her front teeth out. This inspired me to further violence and with an exhilaration I have never previously experienced, I dragged her onto the floor and began to beat up her body in the same way. Of course she fought back and I can still feel the slashing of her fingernails across my cheek and the kicks of what felt like hobnailed boots on my back. At last I detected the waning of her strength, and the fight was over. Then the scene changed, and I found myself in another room walking toward this woman, who was now transformed and wearing a nurse's uniform. As we approached each other, I reminded myself that I must not magically change the events of my lucid dream but allow them to happen spontaneously and observe the outcome. I noticed that she was smiling now and that her front teeth were back in place. She then put out her arms to me in a friendly gesture, and we hugged each other.

"I woke up with a great sense of well-being..."
(Faraday, 1973, p. 300-301).

This research project concerns three fundamental questions:

1. What levels of dream meta-cognition, both self-

reflectiveness and control, are demonstrated by dreamers?

2. Can dream meta-cognition be learned? Alternatively, do dreams remain isolated from waking attempts to increase meta-cognitive processes?

3. If dream meta-cognition can be learned, by whom can it be learned?

Deficiency views of dreaming.

Since the turn of the century (Freud, 1900), the predominant conception that dreaming is cognitively deficient relative to normal waking consciousness (Globus, 1987, p.12) has regularly used as examples the 'fact' that the dreamer can neither be self-reflective nor intentional.

"The sleeping self has no pragmatic interest whatsoever in transforming its largely confused perceptions into a state of partial clarity and distinctness, in other words to transform them into apperceptions.

"... The dreamer, however, has no freedom of discretion, no arbitrariness in mastering the chances, no possibility of filling in empty anticipations. The nightmare, for instance, shows clearly the inescapableness of the happening in the world of dream and the powerlessness of the dreamer to influence it.

"... Yet among these activities [of mind] there are none of apperceiving and of volition. The life of the dream is without purpose and object" (Shutz, 1962, p. 240-242).

The Freudian notion of suspension of ego control during 'unconsciousness' as sleep is often thought to be (e.g. Malcom, 1959), provides a common theoretical framework for cognitive deficiency views which vary in extremity. In hard terms, Hartmann (1973) stresses aspects of normal waking consciousness (NWC) which subserve "feedback-interactive

self-guidance - associated with a continuing sense of self over time" (p. 148) and which he claims are "entirely absent" during dreaming. This view articulates a passive conception of dreaming, or one that is characterized by a general lack of intentionality and an inability to self-reflect (Hilgard, 1977). A soft version refers to reduced needs for overt action and relaxation of voluntary control and critical evaluation (e.g. Cartwright in Fishbein, 1980, p. 242; Wasserman and Ballif, 1985).

Rechtschaffen (1978) describes statistically normative dreaming as single-minded and isolated from other systems of consciousness. He cites as evidence for "massive non-reflectiveness" the typical lack of dream lucidity, the lack of imagination in the dreamer while he slavishly attends to dream story events for long periods, and generally poor recall for dreams. Rechtschaffen suggests that these manifestations are due to the relative isolation of dreams from stimulus input, autonomic activity, organismic state and motor output, and reasons that dream isolation must therefore serve the underlying functions of dreaming by suspending ego control. This circular logic, based exclusively on impressions of dreams from the middle of the normal distribution in American culture, reduces the status of dream self-reflectiveness to at best the serendipitous, and at worst the dysfunctional.

The deficiency view of dream cognition in general and

of intentionality and apperception in particular, has formal explication in the state-shift theory (Koukkou and Lehmann, 1983). There is a psychophysiological theory of dreaming, rooted in the psychoanalytic assumption that dreams are regressions. It posits the deficits in terms of activation/arousal. Their fundamental observation is that the fastest EEG patterns are generated by the vigilant adult brain. Consequently, their fundamental and reductionist assumption is that slower EEG patterns represent lower levels of vigilance and temporary regressions to brain states associated with earlier developmental stages. Thus, the lower frequency of integrated electric activity found in sleep is theoretically reflected in decreased functional complexity of information processing relative to waking. Consistent with the deficiency tradition, consciousness is equated with waking, and the impossibility of self-reflective dreaming is stated unequivocally (Koukkou and Lehmann, 1983).

Another example of a deficiency theory is the activation-synthesis hypothesis (McCarley and Hoffman, 1981) which reduces dreaming to REM sleep physiology. The equation of REM sleep with dreaming is untenable in the light of non-REM dreaming (Foulkes, 1962; Vogel cited in Weiss, 1986, p.9). Nevertheless the theory stresses initial activation in the brainstem at the expense of accounting for the moderating and controlling influences of cortical feedback

on dreaming (Foulkes, cited in Rechtschaffen, 1983). According to this theory, the conscious correlates of brainstem commands for oculomotor and somatomotor movement (corollary discharge information) constitute the matrix from which dream experience is elaborated (McCarley and Hoffman, 1981). All dream events begin as physiological accidents. In this theory, the REM sleep activation of a hypothetical brainstem pattern generator is necessary for each dream activity. Since these patterns are developed during waking, dream activities for which there is no brainstem pattern generator are left unaccounted for. It then becomes difficult to explain creative or recombinatory aspects of dream behavior which require the dream to act on its own output, such as learning to fly (Green, 1968). Dreams are seen as bizarre since they are the outcome of random physiological events. The dreamer does not control or learn to control dream events either from waking or during dreaming.

Crick and Mitchison (1983) have advanced a theory of dreaming based on some assumptions from artificial intelligence, neural net theories and the activation-synthesis hypothesis. Based on a computer model of the brain, the waking mind is seen as processing information in a consistently rational and logical manner. This unlikely view of normal waking consciousness, popular in the field of artificial intelligence, tends to pervade cognitive

science (Gardner, 1985, p. 44), and gives rise to views of dreaming as irrational excitations of 'noise' in a cybernetic system. In Crick's view of 'reverse learning' the sleeping brain dreams in order to dispose of this noise and that to recall dreams is contrary to their purpose. Dream recall is therefore dysfunctional from this viewpoint.

As varied as the deficiency theories are, they hold considerable sway and have in common a view of waking and dreaming as largely discontinuous with one another. The cognitive superiority of the waking mind is not seen as accessible to an isolated dream state. Consequently, these theories do not tend to generate predictions or measurement devices about learning in dreaming, learning to dream from waking, noticing dreaming, learning to notice aspects of dreaming, or learning to control or change aspects of dreaming.

An alternative view: the consciously self-regulating dream ego.

The predominant view which imposes arbitrary ceilings on the cognitive aspect of lived dream experience compared to waking has not been shared by all researchers. Some point to the sheer fact of dream recall as evidence for conscious processes during sleep (Fiss, 1983; Stoyva and Kamiya, 1968) as a response to the widespread view that waking and sleeping correspond to conscious and unconscious processes (Freud, 1900). Some have sought to investigate the

continuity rather than discontinuity of mentation across the sleep/wake boundary. However, the continuity literature is highly dispersed and diversified rather than being a unified body, and has not usually focused on conscious dream cognition by the dream ego. Rather, dreaming has been seen in Freudian terms, as the intelligent process of some dream planning homunculus (e.g. Foulkes, 1978; Foulkes and Schmidt, 1983), as unconscious information processing (Foulkes, 1985, Kuiken, 1986), as metaphor (Antrobus, 1977), and as a visual transduction of cognition (Hall, 1966).

Those studies which look at cognitive complexity within the dream ego typically do so outside a continuity context. Conceptually some of these studies relate to the present research in a tangential way, articulating low to moderate levels of self-reflectiveness and intentional behavior. For example, the dreamer might be described as present and active, and possibly speaking (Bosinelli, Cicogna and Molinari, 1974). However, these studies are embedded within a tonic/phasic research paradigm which uses only tiny fragments of dream reports (Foulkes and Pope, 1973; Molinari and Foulkes, 1969), and which use scales with very limited psychometric properties such as limited range and nominal categories (Bosinelli et. al., 1974; Foulkes cited in Winget and Kramer, 1979, Pp. 114-116).

A few studies have looked at whole dream reports from the point of view of a consciously functional dream ego

(e.g. Hendricks and Cartwright, 1978; Karle, Corriere, Hart and Woldenberg, 1980). Adelson (1959) for example, found that women high in literary creativeness had dreams which showed more detachment, reflectiveness, multiple perspectives, bizarreness, dream control and self-transformations than non-inventive ~~women~~ men, whose stereotyped dreams were characterized by banality, single-mindedness and brevity. In this case, the cognitive complexity of dream experience was not seen as deficient relative to waking, but was seen as a function of an individual difference variable which was continuous for individuals across waking and sleeping. Domino (1976) found almost identical results in his study of waking creativity and primary process dream mechanisms, the main difference being Domino's Freudian (primary process) interpretation of what other theorists (Globus, 1987; Jung, 1974; Rossi, 1972) would call creative dreaming. In a similar vein, Snyder (1970) in a large scale study of REM dreams noted the ongoing background reflectiveness that was similar to waking. A classic small survey by Green (1968) on lucid dreaming went largely unnoticed for years in the scientific dream community, the way observations anomalous to orthodoxy often do (Child, 1985)¹. Green's book documents self-reflective and intentional dreaming in their most impressive form.

The impact on measurement

When these two fundamentally different versions of

dream experience (that is, a passive, cognitively-deficient dream ego versus a self-reflective and intentionally functional dream ego) are weighed in terms of their impact on research, that is, on measurement, it is clear that the deficiency assumption has carried the day. For example, Winget and Kramer's (1979) compendium of available dream scales demonstrates that scaling emphases for dream ego function have been on 1) pathology and symptomatology, and 2) consistency with waking reality. The extent to which the functioning of the dream self is measured is that self-representation should be adequate and realistic, it should be involved in dream events, and its aggressive behavior should be appropriate. Almost no mention is made of any form of 'meta-cognition, with the exception of Foulkes' nominal categories of secondary cognitive elaboration (SCE). One category is a fundamental articulation of dream self-reflection, "awareness of one's mental processes as an object of consciousness" (Winget and Kramer, 1979, p. 115). The SCE categories themselves have minimal psychometric properties.

For the most part, dream researchers have been looking at dreams through a narrow aperture, one which almost precludes the observation of higher level dream cognition, and one which therefore restricts the variety and range of scorable dream experience. The problem is compounded when restricted data on average dreaming in a non-dream culture

such as our own (Cartwright, 1977; Cohen, 1979) is generalized to a theory of dreaming (e.g. Rechtschaffen, 1978). The resulting theory is likely to underestimate dreaming, and would be more accurate and complete if it took into account the range and variability of dreamers' abilities. The capacity for people to demonstrate meta-cognitive dreaming, or to learn to transfer these abilities from waking to dreaming might be illuminated through theoretical and research attention to individual differences. For example, the established differences in dreaming and waking cognitive styles between high and low frequency dream recallers, (Austin, 1971; Bone and Corlett, 1968; Cory, Ormistan, Simmel and Dainoff, 1975; Goodenough, Witkin, Lewis, Koulack and Cohen, 1974; Sheldrake and Cormack, 1974; Schonbar, 1965) probably extend to differences in dream self-reflectiveness (Purcell et. al., 1986) and dream control (Wallin, 1977). (Chapter 3 presents a more complete discussion.) The study of extreme groups is a design tool which can contribute to the resolution of this difficulty. Similarly, the development of psychometrics which reflect the full range of dream functioning reported in the phenomenological literature (e.g. Green, 1968; Garfield, 1974, 1979) is required.

Since dream measurement has not kept pace with dream phenomenology, meta-cognitive dreaming has been cast as 'non-ordinary' in comparison to so-called 'ordinary'

dreaming (Foulkes, 1985; Rechtschaffen, 1978). This conceptual dichotomy can be seen as co-determining with the failure of measurement.

The advent of lucid dream research.

A wave of investigations into lucid and intentional dreaming has been initiated (Gackenbach, 1978; Hearne, 1978; LaBerge, 1980; Malamud, 1979; Tart, 1979; Wallin, 1977) challenging the established view that such events did not occur, or had no place in a theory of normal dreaming because they were 'vanishingly rare' (Rechtschaffen, 1978). This line of research has continued to develop (Blackmore, 1982; Dane, 1984; Fenwick, Schatzman and Worsley, 1984; LaBerge, 1985; LaBerge and Gackenbach, 1986; McCarley and Hoffman, 1981; Ogilvie, Hunt, Tyson, Lunescue and Jeakins, 1982; Purcell, et. al., 1986; Tholey, 1983; Tyson, Ogilvie and Hunt, 1984), although it is still outside the mainstream. Now that lucid dreaming is a more commonly acknowledged phenomenon, investigators gathering dream data for a variety of research purposes are beginning to notice spontaneous lucid dreams in their data sets, although these are typically not formally reported (e.g. Stephen Butler, personal communication; Marion Cuddy, personal communication; Howard Schachter, personal communication).

The main findings of the research on lucidity have established awareness of dreaming while dreaming as an

empirically observable event, since subjects can be taught to signal the onset of lucidity in a way which is reliably recognizable from the polygraph record (Dane, 1984; Hearne, 1978; LaBerge, 1980; LaBerge, Nagel, Dement and Zarcone, 1981; Ogilvie et. al., 1982; Fenwick et. al. 1984). This is done by exploiting the naturally occurring eye movements of REM sleep, such that the subject executes a pre-arranged pattern of such movements when first aware of the dream state. This methodological coup successfully counters Malcom's philosophical (1959) argument against consciousness in sleep since the dreamer cannot tell an observer that he is conscious or dreaming. With this objective indicator of lucid dreaming available, LaBerge (1985) has documented considerable autonomic nervous system reactivity to specific dream events, as would occur in comparable waking circumstances.

In addition it has been found that: 1) lucid dreaming is much more prevalent than imagined a few years ago (Blackmore, 1985; Dement, cited in LaBerge, 1980; Gackenbach, 1978; McCarley and Hoffman, 1981); 2) that most people (58%) dream lucidly at least once in their lives and that many (21%) do so quite frequently (Snyder and Gackenbach, 1986); 3) that there are individual differences involved with who tends to develop the skill (Blackmore, 1982; Gackenbach, 1978; Purcell et. al., 1986); 4) that lucidity and intentional dreaming can be induced (Dane,

1984; Doyle, 1984; LaBerge, 1981; Purcell et. al., 1986; Tholey, 1983; Wallin, 1977); 5) and that there is considerable therapeutic potential for lucidity and intentionality while dreaming in terms of self-exploration, insight, catharsis, and the purposive interruption or transformation of nightmares (Faraday, 1974; Green, 1968; Malamud, 1979; Purcell et. al., 1986; Tart, 1979; Garfield, 1984; Orr, Dozier, Green and Cromwell, 1968).

Responses to Lucid Dream Research

So far there are few attempts to account for lucid and intentional dream phenomena theoretically or to index such an account psychometrically. Usually, the theoretical attempts still bear the stamp of the deficiency tradition by maintaining the dichotomy between ordinary and non-ordinary dreaming (Hunt, 1982; Tart, 1979), or by explaining lucidity non-psychologically, in terms of biological accident (McCarley and Hoffman, 1981). Some good attempts at scaling lucid phenomena (Garfield cited in Gackenbach, 1978) or combined lucid/control phenomena (Malamud, 1979) explicate the range of lucid phenomena, with little emphasis on the pre-lucid processes which precede them.

For example, Tart's (1975; 1979) 'discrete altered states of consciousness' model has been the one most commonly applied to lucidity, explicitly by Hunt (1982) and implicitly by others (LaBerge, 1985; Foulkes, 1985; Rechtschaffen, 1978) through the concept of 'non-ordinary'.

dreaming. Tart (1979) emphasizes the intentional or control aspects of lucid dreaming, so that for experimental purposes, the dream can become an independent variable. LaBerge (1985) has made extensive use of this research paradigm in his study of lucid dreaming.

The discrete states concept has the disadvantage of creating obstructive boundaries. While claims of special or transcendent knowledge are not explicitly made, the idea of discrete altered states still invokes discontinuities in natural experiencing, and creates the theoretical problem of transitions (Feldman, 1980, pp.1-6). For example, Tart (1979) insists on lengthy lucid episodes with waking levels of cognitive skill, complete memory for normal waking consciousness, and dream control as criterial to the definition of lucid dreaming as a discrete altered state. This conception ignores the incremental advances in these skills found in virtually all the theoretical and empirical lucidity literature (Dane, 1984; Garfield, 1974, 1978; Green, 1968; Malamud, 1979; Ogilvie, Hunt, Kushniruk and Newman, 1983; Ogilvie et al., 1982; Purcell et. al., 1986; Rossi, 1972). In other words, the phenomenon may not be as discrete as it is continuous. Another transition involves the simple shifting of attention that causes the lucid dreamer to lapse into non-lucid dreaming. This seems a small pivot on which to interpret a "discrete altered state of consciousness" (Tart, 1979).

Hunt has a hybrid view such that a banal core of dreaming which is mimetic of everyday life is intruded upon by a creative recombinatory capacity. These bizarre intrusions are also altered states within the dream. To Hunt, lucidity is an example of a rare but important 'second order' of dreaming where this abstract symbolic capacity takes over the entire dream. Hunt's dichotomy of banal (first order) and bizarre (second order) dreaming is not so much an empirical fact as a theoretical map which is necessary to square with a discrete states model. It is difficult to see the necessity for positing intrusions of altered states in both waking and dreaming simply to account for creative cognition. This makes any idea an intruding altered state of consciousness.

There is probably little data-based need to extend a dichotomy into the study of dreaming by emphasizing artificial discontinuities with ordinary dream experience. The split tends to leave lucid dreaming to the "parapsychological wasteland" (Ogilvie, 1982) from which it has so recently been wrested.

Foulkes' cognitive-psychological model.

The most recent attempt to construct a cognitive theory of dreaming (Foulkes, 1985) has made little use of the research on highly self-reflective and intentional dreaming. Survey data reveal the rarity of lucidity assumed by some

authors (e.g. Foulkes, 1985, p. 44; Rechtschaffen, 1978) to be a bogus objection to its validity for a theory of dreaming (Gackenbach, 1978; LaBerge and Gackenbach, 1986; Dement cited in LaBerge, 1980; Reed, 1978; Snyder and Gackenbach, 1986; Tart, 1979), given a conservative estimate of .1% to .3% of all dreams recalled from REM (McCarley and Hoffman, 1981; Purcell et. al., 1986).

"First, lucid dreaming is quite rare - it is the exception that proves the rule of our generally unreflective and involuntary dreaming.. Second, because lucid dreaming is, on the face of it, a different mental organization from ordinary dreaming, it's not likely to be similar to ordinary dreaming in all other respects besides lucidity. Thus, the idea that self-conscious lucid dreamers can be trained to signal to us during sleep about what dreaming is really like has an inherent limitation. Since the system is no longer the same system, the observations may not be pertinent to ordinary non-reflective dreaming. Third, by the same token, however, the study of lucid dreaming can, more indirectly, help in the understanding of typical (unreflective, involuntary) dreaming. Lucid dreaming is a natural (or contrived) experiment in which certain features of ordinary dreaming are altered. By determining the consequences of that alteration on the whole nature of dream experience, we may be able to determine the role of absent self-awareness in ordinary dreaming" (Foulkes, 1985, p. 44-45).

It is the belief of Purcell and her colleagues (1986) that mainstream insensitivity to lucid dreaming as part of normal dreaming (Foulkes, 1985, p. 44; Rechtschaffen, 1978) has inadvertently been encouraged by lucidity researchers who themselves contribute to an artificial polarization of lucid and non-lucid dreaming. The habit creates the problem of stranding the act of 'noticing', as in lucidity, outside a theory of normal dreaming. The problem of unnecessary dichotomization is also extended to dream control by virtue

of its association with lucid dreaming. Additionally, the presence of intentional processes in so-called ordinary dreaming seems to have virtually escaped research notice. As mentioned earlier, several lines of influence may account for this possible oversight. One is the Freudian legacy which sees the sleep/wake boundary as congruent with consciousness versus unconsciousness. Ego control is suspended during sleep, a notion which has caused Rechtschaffen (1978) to posit dream 'isolation' from other systems of consciousness in order to subserve this supposed function. This model therefore emphasizes intentionality in the dream generation mechanism rather than in the dream ego (Foulkes, 1978; Foulkes and Schmidt, 1983). In addition, an emphasis on content rather than process has characterized research, although this emphasis is changing (Hauri, 1975). Another influence is the tendency to physiological reductionism in accounting for dream phenomenology (e.g. Crick and Michison, 1983; Koukkou and Lehmann, 1983; McCarley and Hoffman, 1981). Another is the lack of good instrumentation for evaluating assumptions about dream volitional processes (Winget and Kramer, 1979). Yet another is the comparison of dream mentation with a biased view of waking mentation in cognitive science which stresses those voluntary and deductive mental processes which can be successfully modeled by computers (Gardner, 1985). Foulkes (1985, p. 18) acknowledges the bias in the word

'involuntary' when applied to dreaming, but then proceeds as if the qualification had no implications.

"... being able to take the dream where you want it implies the return of voluntary self-regulation, whose presence makes lucid dreaming rather different than un lucid dreaming. Furthermore, such control is difficult to achieve (and uneasily managed even when it is achieved), which makes it unlikely that it characterizes much garden variety dreaming, with its absence of voluntary regulation" (Foulkes, 1985, p. 150).

Rossi's phenomenological theory of dream self-reflection.

The dichotomization of what may be continuous phenomena appears to have finished bearing its fruit. Perhaps a strategy with a better yield would be one which does not create divisive boundaries, but simply broadens the range of possible observations. Only one theory of dream meta-cognition was found which was compatible with this logic.

Rossi's (1972) phenomenological theory of self-reflectiveness in dreaming and waking emerged from his work as a clinician. The theory is developmental in the sense that there are stages of dreaming, the attainment of which requires the presence of a feedback loop between dreaming and waking consciousness such as that provided by some psychotherapies (Corierre et. al., 1980; Rossi, 1972) or private dream-work (Garfield, 1979). The basic mechanism for this feedback loop is 'attention' to the recalled dream.

Rossi begins with the assumption common to Jungian, existential and humanistic thought that dreams and fantasies reflect aspects of our phenomenal world. In other words,

they reflect us as do mirrors; they self-reflect. Thus their function is to be 'noticed' (Moffitt, Hoffmann, Wells, Armitage and Shearer, 1985), or attended to (Rossi, 1972). Self-reflection and dreaming can then be seen as components of the same phenomenological process. The process of psychological differentiation occurs with self-reflection because attention facilitates noticing, which in turn allows for insight. These processes constitute resources toward the range of behavioral choices perceived by the dreamer, whether in waking or in dreaming. Through further self-reflection the implications of behavior can then feed back on subsequent cognition and behavior.

Conversely, this process can be underused. In Rossi's terms,

"When the dream seems to be nothing more than a repetition of routine daily activities, the autonomous process is not sufficiently engaged; the dreamer's conscious identity is too rigid and tends to block out the inner processes of creative change and development" (Rossi, 1972, p. 162).

When dreaming is ignored, "this endogenous process of psychological growth, change, and transformation" (p. 142) is dormant and dreaming is banal. This curtails the development of "self-actualizing" behavior which evolves from autonomous to consciously modulated processes. The human capacity to learn self-reflection is requisite to structure the original psychological experience of dream images into new patterns of awareness and behavior. This is

due to information transfer among states, that is, recalling dreams and attending to dreaming during waking.

Rossi sees dreams as filled with possibilities, some tried and true for the dreamer, some overworked and even dysfunctional. Others are new, alien, untried, and provide opportunities for the expansion of choice. Bizarreness then, is an indicator of change; singlemindedness and banality are indicators of stasis in this theory.

Rossi's theory is one which emphasizes a continuity of conscious processes between waking and dreaming. The theory of self-reflectiveness is framed in clinical/humanistic terms, but its status as a meta-cognitive capacity makes it easily reframed for a cognitive experimental phenomenology. Self-reflectiveness can be conceived as a self-organized subject/object relation wherein both subject and object of attention are 'self'. In other words, a self-organized, recursively nested deployment of attention is the cognitive basis for an explanation of lucid dreaming. Rossi's thinking is consistent with a systems perspective in that he sees dreaming and waking as co-determining, co-evolving processes. Both spontaneously occur, but the 'initial kick' (Maruyama, 1963) which sets this co-evolution in motion is 'noticing' the dream, first from waking, and increasingly, from within the dream itself.

Rossi makes a developmentally ordered listing of dream categories on the self-reflectiveness dimension beginning

with ego-absent dreams and culminating in multi-level awareness by the dream ego. The dimension depicts the gradual differentiation of each level of awareness. Progress through the stages from none to two or more levels of awareness oscillates between categories with an explicit number of levels, and categories wherein the next level is implicit in the dream structure, anticipating the next level. For example, the dreamer may put himself in a position of objectivity or distance which sets up the likelihood of his reflecting on events (level 4), even though explicit reflections occur at the next level (5). Similarly, the dreamer may experience two different ways of being (e.g. a change in age or role, level 6), but the simultaneous awareness of the two roles or ages etc., occurs at the next level (7). Gradually, Rossi unfolds the dimension of 'levels of awareness' (self-reflection) from none to many.

More specifically, 1) in the simplest case the dream contains no people, nor personal objects, nor associations which the dreamer can recognize. 2) After this point, people and personal associations are present, but the dreamer is not. 3) The next stage represents most of normative dreaming wherein the dreamer is singleminded or completely caught up in the dream drama with no other perspective on himself or his actions. Because the awake person often makes the (self-reflective) connection between such dreams and his own emotional needs in daily life,

these dreams are said to contain the potential for self-awareness, were waking attention directed toward them. 4) At the next stage on this continuum, the dreamer is largely an observer in the dream, but not a participant. At this point, a self-reflective process within the actual dream is beginning to be evident. 5) From there, the dream may develop such that soliloquies and dialogues occur, about which Rossi claims,

"...the discriminating power of the word apparently evolves from the imagery of the dream drama and greatly enhances the clarity and significance of self-reflection. Verbal associations form cognitive networks binding more autonomous processes of emotion and imagery for the construction and stabilization of new states of awareness. The word in dreams thus touches upon a growing edge of the personality, a place where awareness is expanding and a new identity is being synthesized" (p. 133).

6) At this level of self-awareness, the dreamer may experience multiple states of being within the dream. He may experience two or more self-images in the same dream, each of which represents a different state or way of being, for example, role changes, different chronological stages, metamorphoses, and more. 7) Finally, multiple levels, as opposed to states, of awareness appear in the dream at the same time. In this category, the dreamer is fully self-reflective "Examination of one's thoughts, feelings or behavior in a dream, implies that one is taking one's self as a subject for observation" (Rossi, 1972, p. 139). The experiencing self and the examining or observing self express two simultaneous levels of awareness. Bizarreness

represents a different perspective from the dreamer's, and as such is a 'multiple levels' dream. Rossi states that a perspective or level of awareness very different from one adhered to in every day life is quite naturally grotesque, weird or idiosyncratic, and that what is common and expected in dreams, is ordinary only from the perspective of one's daily habitual and singleminded frame of reference. In Rossi's category of most highly self-reflective (multi-level) dreams is interestingly contained nearly every form of pre-lucidity and lucid dreaming mentioned in the descriptive literature, such as, the dream within a dream, deja vu, analyzing a dream while dreaming, and dream control. Rossi does not delineate dream evolution beyond the multiple-levels category; his intention was more theoretical than psychometric. The main contribution of his work toward the present discussion is a psychological account of how dreaming and waking co-evolve and participate in the processes of psychological differentiation through the person's capacity to self-reflect.

The psychometric response: scaling dream self-reflectiveness.

The only two studies using Rossi's theory, to the author's knowledge, were done by Purcell et. al. (1986), who chose to see the difficulty of dream deficiency as at least partially resolvable with a metric based on a self-reflectiveness dimension. The authors made certain

modifications for their research processes (Appendix A contains the Dream Self-reflectiveness scale and manual). They wanted to use the spontaneous dream report only, without any waking associative material from subjects, to make a conservative evaluation of within-dream self-reflectiveness. They therefore excluded the use of interpretation, inference or association from the dreamer's waking perspective as part of the scoring. For example, bizarreness was limited to that bizarreness noticed by the dreamer within the dream and appearing spontaneously in the dream report. Consistent with the phenomenological method, dream scorers made no judgement as to what is bizarre (category 7) and simply scored those occasions where the dreamer spontaneously reported awareness of the oddity during the dream.

There was an additional reason for this modification. There is a self-contradictory element in the multiple levels category of dream self-reflectiveness regarding bizarreness. From Rossi's humanistic phenomenological perspective, bizarreness is not an objective absolute (categories defined by therapist or experimenter), but rather a relative and subjective judgment defined only in the dreamer's terms. An error may lie in the fact that this judgment may come from the dreamer's waking perspective. For Rossi, while it is more theoretically consistent if it must come from the dreamer within the dream. Otherwise it is not a within-dream self-

organized state comparable to the other types of multi-level (category 7) dreaming enumerated by Rossi. Bizarreness without concurrent recognition of it as bizarreness would at most be an example of multiple states (category 6), and at least, demonstrate the dreamer's singleminded lack of conscious integration of the other perspective. Support for this position resides in the theoretical and empirical fact of pre-lucidity (Green, 1968; McCarley and Hoffman, 1981; Ogilvie, Hunt, Tyson, Lunescu and Jeakins, 1982; Purcell et. al., 1986). The critical attitude adopted by the dreamer toward what he is dreaming constitutes the various forms of pre-lucidity (Green, 1968) which also comprise Rossi's multilevel awareness category.

Following Green's (1968) explication of pre-lucidity and lucidity, Purcell further differentiated these categories from the general multi-level point where Rossi stopped. Control over the dream and finally, lucid dreaming comprised the upper end of the sequence (categories 8 and 9). Category 7 remained for those multi-level dream events which logically require less self-reflectiveness such as, watching and participating simultaneously or recognizing a dream oddity without concluding that one is dreaming. The range of these lucid/control categories could be further extended and elaborated if it suited research purposes (e.g. Malamud, 1979).

In Purcell's (1986) laboratory study, significant

differences in self-reflectiveness were found in the dream reports of REM and stage 2, and between high and low frequency dream recallers. The dream ego is more self-reflective in REM than in stages 2 and 4 which do not differ. In the dream diary experiment it was found that dream self-reflectiveness in Baseline subjects was identical to that of laboratory subjects collapsed across sleep stages. It was also found that dream self-reflectiveness can be increased in at least three different ways: 1) through increasing simple attention to dreaming, 2) through post-hypnotic suggestion, and 3) through rehearsal of attention patterning schemas learned during wakefulness. When waking attention predisposes dreaming attention to specific reflections (especially noticing a dream oddity within the dream), awareness of dreaming frequently ensues.

In each of two experiments together comprising 72 subjects having 585 dreams, self-reflectiveness was a normally distributed variable in baseline and control subjects. This was true whether or not subjects were selected for high and low dream recall frequency. These results suggest that a view of lucidity as dichotomous, as either there or not there, is better replaced by one of a continuous process of self-reflection which includes lucid dreaming. The resulting shift for a general theory of dreaming is that it is more self-reflective than is generally thought, and could possibly be much more so were

cultural entrainment mechanisms operating to enhance this dream process. (Purcell et. al., 1986).

It is in the context of this approach and its findings that a psychometrically adequate scale for intentional dreaming was sought (see Chapter II). The Dream Control Scale permits an empirical evaluation of the standard view that dreaming is deficient in voluntary processes. As with the Dream Self-reflectiveness scale, dream control is seen as a continuous variable rather than a dichotomous one. This view allows for a depolarization of how intentional processes have been conceptualized: that is, dream control is either present or absent; or that the presence of dream control distinguishes the dream as non-ordinary as opposed to ordinary.

In view of Green's (1968) and Garfield's (1974) delineation of two main lines along which lucid dreaming may develop (i.e. through developing dream control, and through developing a critical attitude to what is dreamt), these two vectors may be scaled separately. On Rossi's continuum, dream control is seen only in its final form as a multiple levels type of dreaming, without developmental antecedents. What may for some authors represent a lack of intention, through failure to be involved (Corriere and Hart, 1980; Mahrer, 1971), represents the beginnings of a detached perspective for Rossi and appears in category 4. However, his emphasis is more on the cognitive/insight or

attentional dimension which he calls self-reflectiveness. The ontogeny of controlled dreaming has its own scalable sequence (see Chapter II).

Summary and Implications.

This research addresses the long-standing polarization of opinion about conscious self-regulatory functioning during dreaming. Certain meta-cognitive capacities that have recently received research attention such as lucid dreaming (LaBerge, 1985) and dream control (Wallin, 1977) are not understandable within the framework of current dream theory in experimental psychology. The clinical dream literature, which is biased toward maximizing the dream's cognitive potential, has provided the most adequate explanation of complex cognition in the dream state. Ernest Rossi (1972) described his clinically derived self-reflectiveness dimension and thereby provided the most developed theoretical account of lucid dreaming and dream control that was found. He proposed a feedback loop between waking and dreaming mediated by simple waking attention to dreaming, such that experience in both states was potentially co-determining and, through time, co-evolving. Purcell's studies used a scale of self-reflectiveness extracted from Rossi's theoretical dimension and supported several aspects of Rossi's dynamic view of the dreaming/waking relationship. For example, dream recall frequency was seen as an important

parameter which can constrain or enhance the waking/dreaming co-evolution of psychological differentiation. High frequency dream recallers showed higher baseline levels of dream self-reflectiveness than did low recallers. It was also shown that a dream process such as self-reflectiveness could be influenced via attentional manipulations in normal waking consciousness, as opposed to the simple content incorporations of most dream control research (review by Tart, 1979) which are based on the concept of day residue (Freud 1900/1956). The results supported the notion that attention to the complex information exchange between states adequately constitutes the mechanism through which certain dreaming and waking processes might be co-determining. Questions that remained from the Purcell studies concerned the differential effects of treatment on high and low frequency dream recallers of both sexes, and the effects on subsequent waking cognition/experience from an increase in two forms of dream meta-cognition. These same questions apply to the dream control vector, which is relatively unstudied. The present research project is designed to amend some of the methodological inadequacies which act to limit instead of demonstrate the range of the phenomena under investigation. Most notably these inadequacies are small sample size, scales with inadequate psychometric properties, and a neglect of individual differences.

CHAPTER II

Study 1

This study investigates the process of dream control, that is, the extent to which the dreamer's intentionality is operative in determining dream events. Control by the dreamer within the dream (called intentional dreaming by Wallin, 1977) is not to be confused here with the related phenomenon of experimenter control, a research paradigm which sees dream control as a subject's successful incorporation of content elements of pre-sleep stimuli presented by the experimenter (see Domhoff, 1985; Tart, 1965, 1979 for reviews). The essential distinction is the one between process and content. The focus here is on the process by which the dreamer comes to respond to any number of dream generated situations by perceiving behavioral options and acting to bring about an outcome which suits the dreamer.

This focus emerged from previous investigations of lucid dreaming, or, awareness of dreaming while dreaming (Purcell, et. al., 1986), wherein dream control becomes an imminent capacity. When a dreamer becomes conscious that his world is a dream world, he may exploit this awareness by flying, experimenting, transmuting his body, or otherwise influencing his dream experience (Chang, 1963; Garfield, 1979; Gillespie, 1986; Green, 1968; LaBerge, 1985; Tart, 1979). The dreamer may even follow plans concocted during

wakefulness (Brown, 1936; Green, 1968; Hearne, 1982; LaBerge, 1985; Tart, 1979). This freedom to choose, influence, or control dream structure and events is learned, expands with practice, and includes the acquisition of many dream skills. In fact, a classical learning curve has been used to describe the acquisition of control over lucid dream duration (Garfield, 1976).

It also appears that in some individuals, intentional processes can become enhanced in the absence of lucidity with auto-suggestion and practice (Doyle, 1984; Garfield, 1974; Malamud, 1979), with psychotherapy (Hendricks and Cartwright, 1978; Corriere and Hart, 1977; Corriere, Karle, Woldenberg and Hart, 1980; Mahrer, 1971), with psychodrama techniques (Wallin, 1977), and group support (Garfield, 1974; Greenleaf, 1973; Hart, 1971; Wallin, 1977). These intentional processes have become referred to as pre-lucid control (Ogilvie, Hunt, Tyson, Lunescu and Jeakins, 1982), implying a yet-to-be investigated range of intentional functioning during dreaming.

Observations regarding lucidity and lucid control emerged empirically (Green, 1968) in the absence of a theoretical framework within which they fit. These phenomena clearly did not square with prevailing notions of unconsciousness which were based on sleep and the suspension of ego control (Freud, 1900). The cognitive (attentional and intentional) deficiencies which are corollary to such a

conception of the dream state leaves dreams with high levels of ego functioning as oddities beyond accounting (Foulkes, 1985; Freud 1900/1956); Rechtschaffen, 1978). The theoretical fate of self-reflective, lucid and intentional dreaming has been consistent with this 'deficiency' logic and such processes are hence branded 'non-ordinary' (Foulkes, 1985; LaBerge, 1985; Rechtschaffen, 1978) and beyond the pale of 'ordinary' dream theory. By default then, self-reflective dreaming (as lucidity has been called by most researchers) was seen dichotomously as either present or absent, and dream control seems subsequently to have suffered the same fate.

Green's (1968) concept of pre-lucidity and Rossi's (1972) dimensional concept of self-reflectiveness points the way to a more continuous and sequential view of lucid dream development. These views lend greater power to a theoretical explanation of lucid dreaming in terms of attention, learning, cognition and socio-cultural factors (Feldman, 1980; Hunt, 1982; Purcell et. al., 1986). The view taken in this thesis is that dream control as a single unitary category requires further delineating.

While the amazing range of dream control possible in the lucid dream state became more apparent (Chang, 1963; LaBerge, 1985; Tart, 1979), Green (1968), Garfield (1974) and to some extent, Rossi (1972) were struck with pre-lucid forms of dream control. Garfield (1974), who became

proficient at intentional dreaming before she developed habitual lucid dreaming, states:

"Only two of the systems [for developing dream control] require high consciousness during the dream state: lucid dreamers and Yogi dreamers. You need some degree of dream consciousness to recognize that you are supposed to confront danger rather than run (in a dream). Lucidity is unimportant in the other systems and hence may limit their usefulness. You can shape your dreams without high consciousness, but the more aware you become of your dream state while you are in it, the more you will be able to actively relate to it and use it to your benefit" (p. 205).

For many authors, the importance of lucidity resides in its capacity to enhance dream control. Control is seen as play or therapeutic treatment (Faraday, 1973; Garfield, 1974), as a scientific tool for the advancement of psychophysiology (Green, 1968; LaBerge, 1985; Tart, 1979), and philosophically, as a tool for the ultimate recognition of all mental phenomena as illusory (Chang, 1963).

While dream control typically accompanies a stabilized capacity for lucidity, its development also appears to precede lucidity in some people (Garfield, 1974; Wallin, 1977). Dream control and lucidity appear to be complementary and interactive in that the emergence of one typically leads to the emergence of the other, and that each capacity is maximized in the presence of the other. But however highly interactive they may be, the mechanisms of noticing and acting are not the same and their variations do not lie on the same dimension.

Rossi's construct of self-reflectiveness can be seen as enumerating levels of awareness. Dream control involves more

than one level of awareness (dreaming and controlling dreaming) and is therefore a complex form of dream meta-cognition on his dimension, as is lucid dreaming. It occupies one high level category and the development of intentionality is not otherwise mapped. What for some authors represents low control, that is, lack of involvement and hence the denial of the opportunity for mastery (Corriere, Karle, Woldenberg and Hart, 1980; Hendricks and Cartwright, 1978; Mahrer, 1971), for Rossi represents the beginnings of a detached perspective, or opportunity for self-reflectiveness. His emphasis is more on the attentional dimension (noticing, insight) which he calls self-reflectiveness (see Self-reflectiveness scale summary, Table 2.1, manual in Appendix A).

The alternative to the view that executive functions (ego functions, self-regulatory functions) are relaxed or suspended during dreaming is that they are not suspended or relaxed, and that the dreamer attempts to cope with dream situations similarly as he does with waking ones. That is, his involvement, courage, effort, expressiveness, mastery and success all vary, often independently. Similar variation has been found for the dreamer's degree of perceptiveness, both of himself and of situations.

The net conclusion here is that perceiving and acting require separate scale measures on logical and functional grounds. In addition, such scales provide normative data for

describing the nature and range of those human abilities which are necessary for the further development of a psychological theory of dreaming.

The Development of a Scale for Dream Control

The procedure for instrument development was taken from Brown (1970).

The Construct. On the basis of the empirical and clinical literature, the dream control dimension can be ordered as it occurs without lucidity (control 'in' the dream), and as it progresses around and after the attainment of lucidity (control 'over' the dream). On such a scale, pre-lucid control precedes awareness of control logically, ontologically and chronologically (Garfield, 1974; Green, 1968; Malamud, 1979). Dreams in the population vary in the degree of 'control in' the dream situation wherein the dreamer might demonstrate control over his own actions and on his environment (Brenneis, 1970; Hall and Van de Castle, 1966; Sheldrake and Cormack, 1974). An example of a low category on this dimension is: dream characters, but not the dreamer, are carriers of the dream action (Corriere and Hart, 1977; Mahrer, 1971). Control 'in' then increases until the dreamer is carrier of the action, responding effectively to dream situations. Power and 'luminosity' (peak experiencing) may be expressed by the dreamer in the fully successful dream (Corriere et. al., 1980).

Control 'over' is seen as a higher order of control

than control 'in'. The ability for control 'over' dreaming develops in some dreamers who can compose dreams (Garfield, 1974), or change an element in a recurring nightmare (Halliday, 1982; Tart, 1979; Wallin, 1977), or may choose to awaken from them entirely (Green, 1968; Orr, Dozier, Green and Cromwell, 1968). In Jung's (1974) sense, the dreamer is the scene, the player, the producer, etc. When he acts as though he knows this, he has control 'over' his dream. When he notices this, he becomes lucid.

This degree of control is usually a precursor to lucid dreaming ability. When the person knows it is his own dream, his role as 'owner' of it has been found to expand the magnitude of his control over dream events (LaBerge, 1985), the morphology and capabilities of his own body (Chang, 1963), and his command of cognitive abilities (Green, 1968; Tart, 1979; Van Eeden, 1913/1972). The person is consciously and intentionally participating in the processes of dream formation puzzled over by Cartwright (1974, p. 388), Foulkes and Schmidt (1983) and Globus (1987).

Available Scales. An instrument was needed which would evaluate the level of dream control expressed in the dream report. A review of available scales showed that none were well-suited to the present purposes on theoretical or psychometric grounds, although some were partially suitable. For example, Ogilvie, Hunt, Tyson, Lunescu and Jeakins

Table 2.1. Self-reflectiveness scale categories in abbreviated form.

CATEGORY	PROCESS LEVEL
1.	Dreamer not in dream; objects unfamiliar; no people
2.	Dreamer not in dream; people or familiar objects present
3.	Dreamer completely involved in dream drama; no other perspective
4.	Dreamer present predominantly as observer
5.	Dreamer thinks over an idea or has definite communication with someone
6.	Dreamer undergoes a transformation of body, role, emotion, age etc.
7.	Dreamer has multiple levels of awareness: simultaneous participating and observing; dream within a dream; noticing oddities while dreaming
8.	Dreamer has significant control in, or control over dream story; can wake up deliberately
9.	Dreamer can consciously reflect on the fact that he is dreaming.

Note 1: For Rossi (1972), dream control, pre-lucidity and lucidity are all examples of dreams with multiple levels of awareness (here, category 7). We have assigned these dreams additional categories (8, and 9) because of our research interests.

Note 2: We have restricted our use of bizarreness to those oddities which are recognized by the dreamer within the dream. We have similarly restricted transformations (category 6) to those in the dreamer only, excluding those in the environment or of other dream characters.

(1982) looked at non-lucid, pre-lucid and lucid dreams in terms of whether control was present or absent. In contrast to this tri-level, but still dichotomous approach to dream control, the present author makes the assumption that dream control is a continuous variable which theoretically ranges from none at all (McCarley and Hoffman, 1981), through a range (Mahrer, 1971; Green, 1968), to absolute control (Chang, 1963).

This ordinal view is consistent with Brenneis' (from Winget and Kramer, 1979, p.96) who sees dream control as one of 34 dimensions of ego style. This three point scale sees dream events as 1) entirely within the dreamer's control, 2) at some point out of his control, 3) completely out of his control, and forms a basis for an ordinal scale. The range however, is restricted from a psychometric perspective, and is perhaps too general to ensure inter-rater reliability. Moreover, the issue of control over the dream is not addressed. This was the only scale of dream control per se which was found in the literature.

However, Brenneis (1970) used similar 3 point scales describing other dimensions of ego style which could easily be seen as aspects or strands of a control dimension such as centrality/involvement, activity level, effort/exertion and feeling expressiveness/assertiveness. Such strands present the possibility of multi-dimensional scaling if they summed additively to the construct of dream control. This

assumption was rejected on the grounds that the dream depends for its coherence on the interaction and fit of these strands. Not only is the whole greater than the sum of its parts theoretically, but from a psychometric perspective, it was thought that raters might compound their error variance with several scales per dream when one might do. The Self-reflectiveness scale (Purcell et. al., 1986) adapted from Rossi (1972) served as a model at this choice point. The view was taken that the construct's name is dream control which refers to a cluster of empirically related dream behaviors determined by an underlying factor, that is, volition/intentionality. What varies is the degree to which the dreamer's intention or action is cognitively developed and acted upon with success for the dreamer, although these may not be well explicated in the spontaneous dream report. An inquiry could be developed should it suit an experimenter's purposes. The solution taken here to the philosophical conundrum of determining intentional action was the development of certain textual criteria for scoring each level on a 9 point ordinal dream control scale. These criteria were based predominantly on those of Brenneis' 34 dimensions of ego style which were related to control: centrality/involvement, activity level, effort and feeling expressiveness.

Similar 3 and 5 point scales of these dream traits by other researchers were used to help develop and expand the

2

criteria for each level of the scale. Level descriptions for centrality/involvement were adapted also from Breger, Hunter and Lane (1971; cited in Winget and Kramer, 1979, p. 146) and Cappon (1959, cited in Winget and Kramer, 1979, p. 96). Descriptions of level of feeling expressiveness were adapted also from Breger and his colleagues and from Corriere, Karle, Woldenberg and Hart (1980, Pp. 192-3). What constitutes activity was adapted from Hall and Van de Castle (1966) as well as the notion of failure/success.

These scales formed the basis for categories 1-7 of the control scale, to which non-lucid control 'over' and lucid control added 2 more categories. No attempt was made to discriminate a range of lucid control categories due to the much lower frequency of lucid dreams, although this could be done should it suit an experimenter's purposes. Table 2.2 is a short form of the final Dream Control Scale which appears in full with a detailed manual in Appendix B.

The present study uses the data from a study of dream self-reflectiveness (Purcell et. al., 1986), a data set which has certain benefits and disadvantages for the exploration of dream control. It was an immediate source of a large number of dreams (N=425) already scored for self-reflectiveness and word count. The presence of two kinds of control group in addition to three other treatment manipulations allowed for a reliable evaluation of the Control scale's psychometric properties. In addition,

treatment manipulations aimed at elevating self-reflectiveness scores and triggering lucid dreaming allow for the investigation of aspects of the self-reflectiveness/control relationship under different treatment conditions. There are also possibilities, albeit limited ones, for evaluating the relationship between dream recall frequency and intentional dreaming.

The treatments used in the self-reflectiveness study are provocative for the study of dream control for at least three reasons. 1) The interaction of noticing and acting systems (self-reflectiveness and control) suggests that an effective induction for dream self-reflectiveness might also successfully elevate dream control scores. 2) Dream control was discussed with subjects in three treatment groups. If this information is measurably transferred to their dreams, then the mechanisms of attention/noticing can be used to influence or entrain yet another complex aspect of dreaming. 3) If such carryover effects from waking to dreaming do occur, the findings would constitute important implications for the theory of dream isolation.

The self-reflectiveness study assessed the extent to which self-reflective and lucid dreaming can be learned as a cognitive skill by varying aspects of attention and attentiveness which subjects were asked to pay to dreaming. After 3 weeks of home dream collection, results showed that 4 experimental groups had significantly higher scores on

Table 2.2. Abbreviated version of the Dream Control Scale.

1. The dreamer is not present in the dream. (e.g. The police chased a man down an alley.)

2. The dreamer is present in the dream as an observer and reporter of events. He does not participate, nor does he report his own thoughts and feelings on dream events. (e.g. I watched the police chase a man down an alley.)

3. The dreamer is present^s predominantly as observer, although he may express private responses to dream events or may engage in some minimal peripheral activity. (e.g. I watched the police chase a man down my alley and wondered if he were innocent or guilty.)

4. The dreamer is central or is a main protagonist but control or expressiveness is minimal and the dreamer is weak and ineffectual. (e.g. The police were chasing me. I was cornered in an alley with no chance of escape.)

5. The dreamer has some impact due to more effort or more success than in category 4. (e.g. The police were chasing me for something I didn't do and they were getting closer the faster I ran.)

6. The dreamer gains control over the dream situation to a large extent, but not maximally. Solutions may be banal, temporary, incomplete. (e.g. The police were chasing me down an alley. I hid behind a door.)

7. The dreamer gains full control of himself and the dream situation. S/he may express strong good feelings. (e.g. The police were chasing me down an alley. I was able to outrun them all and scaled the wall easily. I laughed when I realized I had lost them.)

8. The dreamer has control 'over' (as opposed to control 'in') the dream or part of it, or may manipulate dream mechanics as would a film director. An explicit statement of awareness of dreaming while dreaming is absent. (e.g. The police were close on my heels. I thought of a secret hiding place which was quite far off. I slowed the dream down to give myself a head start, and I got to safety in plenty of time.)

9. The dreamer exerts or attempts to exert control over dream events or outcomes in the context of dream lucidity, or, awareness of dreaming while dreaming. (e.g. As soon as I realized I was dreaming, all the anxiety of this chase left me. I turned and faced the policemen and they all smiled at me.)

dream self-reflectiveness than a Baseline group. The most effective treatment was the Mnemonic, wherein attention patterning schemas learned during waking resulted in more self-reflective dreaming than occurred in a report skills (Contrast) treatment, which itself had higher dream self-reflectiveness scores than a Baseline condition. The other treatments, Hypnosis and Auto-feedback (self-scoring feedback using the Self-reflectiveness scale) were approximately as effective as the Contrast treatment in raising self-reflectiveness scores.

Treatment conditions were designed to predispose subjects' attention toward self-reflectiveness in subsequent dreaming through post-hypnotic suggestion (H), auto-feedback from self-scoring of dreams (R), and cued rehearsal of schemas for learning to notice certain kinds of dream situations (M). In the case of these groups, dream control was discussed in close association with lucid dreaming, as either immediately preceding it or following it. Insofar as these treatments are effective, self-reflectiveness and control scores are expected to be correlated.

The Contrast group served as an attention-control condition as compared with an untreated Baseline condition. In other words, this group got experimenter attention similar to treatment groups, although the treatment was not designed to change dreaming itself. These subjects paid attention to their dreams similarly to treatment subjects.

The Contrast group focused on cultivating that introspection which yields a complete, detailed and accurate dream report, and as such, is an attentional manipulation. A similar group called attention-placebo in Doyle's (1984) investigation of so-called Senoi techniques of dream control, showed no changes in dreaming while there were changes in an experimental group.

There are 2 hypotheses:

1. Significant group differences for dream control are anticipated: Mnemonic, Hypnosis and Auto-feedback groups should show higher dream control scores than Contrast and Baseline groups.
2. The correlation between dream self-reflectiveness and dream control should be highest for the same three treatment groups.

Method

Subjects. Forty-eight psychology undergraduates from one class participated for course credit. Twenty-six were female and twenty-two were male. Mean age was 24.1 (s.d.=8.8) years.

Instruments.

1. Initial Questionnaire (Appendix C). Two matching variables were created from this pre-test; 1) self-reported dream recall frequency and 2) a composite lucidity score based on items that queried lucidity and pre-lucidity according to Green (1968). These items were embedded among

questions about other aspects of dream experience.

2. Report Skills Questionnaire (Appendix D). This was a training instrument designed to teach detailed dream reporting, or, cultivate general attentiveness to dreaming. Items queried the presence of thoughts, emotions, speech, bizarreness and the varieties of sensory experience common to dreaming.

3. Self-reflectiveness Scale (Appendix A). This scale (summarized in Table 2.1) was used to teach dream self-reflectiveness to one experimental group and also for scoring of dream protocols by judges.

Procedure. Subjects were ordered on recall frequency and then on composite lucidity score within each of 5 levels of recall frequency. Subjects were then randomly assigned in blocks of four to 4 experimental conditions so that groups were equivalent with respect to the 2 pre-test variables. A no-treatment baseline group was formed subsequent to this procedure on the basis of more students in the class wishing to participate for course credit. Each group suffered some attrition prior to data collection leaving 48 subjects. However, multivariate analysis of variance showed that all 5 groups were equivalent on the pre-test variables. Sex was not considered when assigning subjects to groups since there were no sex differences on either recall frequency or composite lucidity score.

Subjects in all conditions wrote home dream reports for

a 3 week period. In order to avoid a response bias on the basis of social desirability, subjects were told that the experimenters were scientifically interested in dreams as they actually occur, and that any editing to make dreams more coherent or presentable than could be recalled was contrary to experimental purposes. Subjects were also told not to discuss their participation in the study with other students in the class until after the experiment.

Baseline (B): Subjects collected dream reports without further instruction or contact with the experimenter.

Contrast (C): Subjects filled out the report skills questionnaire on the reverse of each dream report sheet, and report skills were the subject of weekly half-hour contact meetings with the experimenter. This group may be seen as either an attention-control condition or a report skills treatment (i.e. an attentional manipulation).

Auto-feedback (R): At the time of writing the dream report, subjects scored their dreams on the self-reflectiveness scale which appeared on the back of each dream report sheet. At weekly meetings the theory of Rossi's process dimension was discussed and any questions subjects had regarding their use of the scale were answered.

Mnemonic (M): During the 3 weeks of the experiment, subjects wore a comfortable leather bracelet which served as a cue

for schema rehearsal whenever it was noticed during the day. This schema involved questioning the present state of consciousness, whether waking or dreaming, and if awake, to develop the intention to dream lucidly that night (Clerc, 1983). Weekly meetings focused on attentional schemas for recognizing the dream state by learning to notice dream-like events. These included dream oddities and contradictions, the recurrence of personal dream themes or events, vagueness or distortion of perceptions, and extreme stress (Green, 1968). Experimenting with the dream (control) was discussed as an adjunct to noticing/recognizing the dream state. Attention was thus focused on highly self-reflective and pre-lucid dream occurrences with highest self-reflectiveness (lucidity) as a target. Subjects filled out the report skills questionnaire on the reverse of each dream report sheet.

Hypnosis (H): Hypnotic inductions occurred once weekly for 30-45 minutes on an individual basis. Taped, standardized inductions were not used as these were thought by the Ericksonian hypnotist (not one of the experimenters) to be insensitive to individual differences in rate and depth of trance. This resulted in some variation in treatment implementation. Subjects were not usually tested for depth of trance and no data on hypnotic susceptibility were collected. Subjects were given post-hypnotic suggestions to

have good recall and lucid dreams with control. They were also given the suggestion to be amnesic for the previous suggestions. At debriefing only one subject had inferred that lucid dreaming was the treatment goal, having accidentally seen the self-reflectiveness scale.

Scoring of Dream Protocols

An initial version of the Control scale was applied to 50 dreams extracted from another data set by the author (J1) and another judge (J2). New judges were also trained on these dreams. The scale was revised in the light of the difficulties encountered in reaching scoring agreement on these dreams before using it on the 425 dreams from the self-reflectiveness study. J1 and J3 rated all 425 dreams. A third set of ratings was obtained by dividing the task among J4, J5 and J6. All initial ratings were performed independently. After every 50-100 dreams, judges met to discuss the 10-15% of dreams which were not rated with the criterion of exact agreement by 2 of 3 judges. On each of these occasions, the scale was revised to resolve the difficulties raised, and was redistributed to the judges. Some scoring difficulties were due not to the scale but simply to judges missing scoring cues in the dream protocols. Only 1 of the 425 dreams was considered unscorable. Since much scale development and rater training occurred during the scoring of the experimental dreams, reliabilities were calculated on a different set of 50

varied dreams. These were scored by J1 J3 and J4 using the final version of the Control Scale (Appendix B).

Results

Scoring Reliabilities

Scoring reliability was considered satisfactory. 45 of 50 sample dreams (90%) were scored on the first round of independent ratings, using the criterion of exact agreement by 2 out of 3 judges. The remaining 10% were resolved by discussion. None of these dreams was considered unrateable.

Table 2.3a shows the distribution of scores for J1 and J3 for 50 sample dreams across the 9 scale categories. Exact agreements (58%) are represented by the diagonal, while discrepant scoring can be seen to be ordinally close to the diagonal with no outliers occurring. This aspect of the ratings resulted in high Pearson correlations between the scores of the judges taken in pairs (see Table 2.3b).

Scale Properties

Table 2.4 demonstrates the close proximity of the measures of central tendency for both control groups (Baseline and Contrast) and for all groups combined, both for subjects and dreams taken as cases. All these distributions are normal, and group variances are homogeneous (see also Table 2.5), supporting the notion that the scale validly represents a normally distributed continuous variable for which parametric statistics are

appropriate (Tabachnik and Fidell, 1983).

Data Analysis

Since subjects had varying numbers of dreams, means were calculated for each subject on dependent measures. Table 2.5 depicts the means and standard deviations for dream control for each experimental group. Figure 2.1 illustrates the distributions of dreams across control scale categories for each group. Figure 2.2 shows these same distributions for Baseline, Contrast and Mnemonic groups.

One way analysis of variance on average control scores revealed significant group differences ($F_{4,43} = 4.045, p < .01$). Post hoc comparison of means using the Student-Neuman-Keuls method showed that both Mnemonic and Hypnosis groups were significantly different from the Baseline group on dream control. There were no other significant mean differences. In order to evaluate group differences when control is seen as a dream trait rather than a subject trait, analysis of variance was performed on a random sample of 40 dreams from each group. Group differences were significant ($F_{4,195} = 4.17, p < .01$). The Baseline group had significantly lower scores than all other group according to the Student-Neuman-Keuls mean comparisons test.

A repeated measures ANOVA to evaluate changes in average control scores across the three weeks of the experiment was not done, due to missing data. Some subjects went more than a week without submitting a dream.

Table 2,3a. Distributions of control scores for 2 judges on 50 dreams across 9 scale categories. The diagonal contains the exact agreements (58%).

		J3								
		1.	2.	3.	4.	5.	6.	7.	8.	9.
J1	1.	<u>5</u>								
	2.		<u>3</u>	1						
	3.			<u>2</u>	3					
	4.			5	<u>6</u>	1	1			
	5.			1	3	<u>5</u>	1			
	6.				1	1	<u>2</u>	1		
	7.					1	1	<u>3</u>		
	8.								<u>2</u>	
	9.									<u>1</u>

Table 2.3b. Pearson correlations in the ratings between pairs of judges.

	J1	J3	J4
J1	1.00	.91	.89
J3		1.00	.88
J4			1.00

Table 2.4. Measures of central tendency for 2 control groups and for all 5 groups on Dream Control scores.

	MEAN (variance)	MEDIAN	MODE
SUBJECTS			
group B (11)	4.10 (.213)	4.00	3.75
group C (11)	4.76 (.455)	4.60	3.67
all subjects (48)	4.75 (.702)	4.64	5.00
DREAMS			
group B (133)	4.23 (1.75)	4.00	4.00
group C (95)	4.88 (1.78)	5.00	4.00
all dreams (424)	4.82 (2.76)	5.00	4.00

Table 2.5. Summary statistics for groups on dream control scores.

GROUP	N Subjects	N dreams	Control $\bar{X}$	s.d.	SR $\bar{X}$	s.d.
M	9	52	5.37	0.91	6.26	1.56
H	9	73	5.05	0.68	5.03	0.85
R	8	71	4.64	1.01	4.31	1.24
C	11	95	4.76	0.67	5.14	0.79
B	11	133	4.10	0.46	3.66	0.47

The overall correlation between dream control and self-reflectiveness on a dream by dream basis is .58 ($N=424$, $p<.01$). Figure 2.2 shows this relationship for the dreams of each group, as well as the relationships with word count. It can be seen that the association between dream self-reflectiveness and control is weaker or stronger depending on treatment condition. The correlations are significantly higher for all treatment groups over the Contrast group ($M>C$, $p<.01$; $R>C$, $p<.01$; $H>C$, $p<.05$), and for the R group over the B group ($p<.05$). As is evident from Figure 2.3, the moderate association between word count and dream control does not change across treatments.

Table 2.6 shows the correlations between dream control and dream self-reflectiveness on a dream by dream basis for each group. The correlations are moderate for the Baseline group and moderate to high for 3 treatment groups. For the Contrast group, the correlations were low to negligible.

This study was originally designed to investigate dream self-reflectiveness in subjects who covered the whole range of dream recall frequency, here divided into five levels. Hence, relatively few subjects belong to genuinely extreme groups on this variable. 48 subjects are not enough to evaluate adequately a treatment by recall frequency interaction. However, when mid-range recallers were omitted from the post-hoc one-way analysis of variance, high dream

Figure 2.1. Distribution of dreams across control scale categories for each group.

Figure 2.2. Distributions of dreams across control scale categories for each group.

Figure 2.3. Group correlations between pairs of dependent variables (n=424 dreams).

Group 1: Mnemonic; 2: Auto-feedback; 3: Contrast; 4: Hypnosis; 5: Baseline

Figure 2.4. Relative frequency of Dream Control scale scores for high and low frequency recallers (n=30).

Table 2.6. Average Pearson correlations between self-reflectiveness and dream control for dreams (N=424) in total and by experimental group.

	DREAMS
Overall:	.58 **
Mnemonic:	.62 **
Auto-feedback:	.69 **
Hypnosis:	.58 **
Contrast:	.25 *
Baseline:	.45 **

* $p < .05$ two-tailed

** $p < .01$ two-tailed

recallers ($n=15$) had significantly greater average dream control scores than did lows ($n=13$), collapsed across groups ($F_{1,26} = 7.222, p = .012$). Figure 2.4 shows the distributions across control scale categories for both high and low frequency recallers. These differences were not significant for dream self-reflectiveness. In the Contrast group, 4 low and 5 high frequency recallers were significantly different from each other on average dream control ($F_{1,7} = 9.8, p = .017$), but not significantly so on dream self-reflectiveness. This same test in the Mnemonic group showed no tendency to be significant.

Other work done in this laboratory (Purcell et. al., 1986) shows a high-low difference for dream self-reflectiveness of borderline significance for subjects awakened from different stages of sleep. These results suggest that in an experiment designed to evaluate differential patterns of response to self-reflectiveness and control inductions between high and low frequency dream recallers, such differences would emerge, at least for dream control, and possibly for self-reflectiveness.

Gender differences in dream control are suggested by the data even though group composition varied with regard to gender. The most successful treatment was the Mnemonic, which was predominantly comprised of males, so that the overall analysis of variance for gender differences is biased toward higher means for males ($F_{1,41} = 9.03, p < .01$).

However, males had higher means in every group regardless of group composition, suggesting a valid and stable sex difference in dream control.

Discussion

The dream control scale was demonstrably adequate psychometrically, as was the self-reflectiveness scale (Purcell et. al, 1986). These scales are correlated ($r=.58$, $p<.01$), in fact, categories 1, 8 and 9 are very similar on both scales. This is appropriate for processes which clearly interact and which at certain points are identical. For example, deciding to wake oneself from a bad dream and doing it, takes both multiple levels of awareness and highly operative intention/action systems.

Although control and self-reflectiveness tend to interact, they do not necessarily do so. For example, the dream ego can act out blindly without reflection, yet a cognitive grasp of the dream situation can lead to expanded choices and a more considered action which has more positive consequences for the dreamer. There is also a potential, though not a necessity, to act on an insight obtained through attending and noticing. Conversely, the dreamer's action can be (self) evaluated, and future action determined in the light of consequences. Finally, recognizing (noticing) that one is actually constructing (intention) dream events tends to precipitate awareness of dreaming

(lucidity), while awareness of dreaming tends to precipitate greater use of power over dream events (lucid control) in some individuals. On the other hand, the dream reports show instances of dream control without lucidity and lucidity without control. Similarly, the observer may be a helpless bystander or a philosopher king. The successful interaction of attention/awareness and intention/action systems is at the core of the 'balance' proposed by Gackenbach (1978) as necessary to the maintenance of dream lucidity, that is, neither awakening nor returning to non-lucid dreaming. The scale and results depict dream control, both logically and empirically as a continuous normally distributed variable. The mean score for all 48 subjects was 4.75, or, the middle range of intentional dreaming wherein the dreamer has some effort and perhaps some success. The median dream score was 5.0, showing that in fully half the 424 dreams, the dreamer demonstrated substantial dream control.

Purcell et. al. (1986) found that these dreams similarly demonstrated dream self-reflectiveness. These data undermine the long held assumption that self-reflectiveness and control (variously called executive functions, ego functions, self-regulation) are relaxed, suspended, isolated or cease simply because one is dreaming. This conception of the sleep/wake boundary is possibly in error and needs to be reviewed in both clinical and experimental theories of dreaming.

The predicted group differences for dream control did occur. The Mnemonic and Hypnosis treatments elevated dream control scores significantly above Baseline. These data are further evidence of transfer or carryover effects from waking to dreaming processes, which do not support the idea that dreaming is isolated from other systems of consciousness (Rechtschaffen, 1978). A mechanism by which these transfer effects occur is that of attention patterned or educated to notice certain kinds of dream situations when they next occur, which may then present themselves as opportunities for intention/action.

Insofar as the data enabled the analyses, high frequency dream recallers have significantly greater dream control than low recallers in the Contrast group. Since dream recall is the classic case of information transfer across states, high recallers have a history of greater attention to this carryover information simply by virtue of their high recall. If it is assumed that the Contrast procedure does not alter dreaming itself (consistent with findings by Doyle, 1984), the habitual contact of high recallers with dream material has increased the dreamer's ability to participate effectively in her own dreams. In high recallers the boundary between sleeping and waking is 'thinner' and more 'permeable' (Hartmann, 1984). Information is more easily transferred from sleeping to waking, and as the present results show, from waking to

dreaming as well.

The fact that this relationship is not seen in the Mnemonic group suggests that a treatment designed to pattern attention toward noticing certain aspects of dreaming concurrently with dreaming, acts as a response equalizer of high and low frequency recallers. The differences between these two types of subjects appear to attenuate as the mechanisms of attention are entrained on dream self-reflectiveness and dream control.

These preliminary results regarding dream recall frequency require replication using a research design which is better suited to evaluating the extremes of dream recall frequency. Similarly, the apparent sex differences in dream control require evaluation through the use of gender as an independent variable. For example, it cannot be seen from the present data whether baseline gender differences decrease as a function of training.

The view is taken here that when meta-cognitive dream acts are seen as anomalous (Foulkes, 1985; Freud, 1900; Rechtschaffen, 1978) or as discrete altered states (Hunt, 1984; Tart, 1975) which are discontinuous with ordinary dreaming, the theory of ordinary dreaming is too restricted. Such views prevail due in part to a lack of appreciation for the cognitive/developmental processes and transitions which precede these meta-cognitive achievements. This fact motivated the present contribution to the measurement of

such processes.

Dream control has a unique position vis a vis our understanding of dream generation. It is a process in which the dreamer may increasingly expand his conscious participation in the construction of what has often been seen as a strictly involuntary process. The scale developed here documents variation in "dreaming and being dreamed" (Humphrey, 1983, Pp 73-92), or, from getting dreamt, to actively dreaming, to active dream construction. These results contribute to our appreciation of the processes of dream formation as in part a consciously constructed and apprehended encounter, both between and within states of sleeping and waking.

CHAPTER III

Results from Purcell et. al. (1986) and from Study 1 in Chapter II are supportive of a view of the sleep/wake boundary as permeable (Hartmann, 1984) and open to the transfer of information rather than generally closed and isolating (Rechtschaffen, 1978). The results are additionally provocative in that certain individual difference variables, particularly self-reported frequency of dream recall, appear to be significant modifiers of the permeability of this boundary. Finally, it appears that the flow of information across states can be increased through attention and learning.

Rossi's (1972) theory of a dialectic between sleeping and waking experience, if attention is educated to the process, appears partially borne out by the differences in self-reflective and intentional dreaming found between subjects representing the tails of the recall frequency distribution. If dream self-reflectiveness and control are products of such a dialectical process, or, if waking attention to dreaming sets up a deviation amplifying mutual causal system (Maruyama, 1963), then the actual frequency of attention to dreaming (i.e. recall) should predict higher levels of self-reflectiveness and control for high recallers compared to, low recallers. Purcell's methods could be extended to produce a more definitive test of this prediction. While high and low recallers would both be

expected to increase their dream operativity, that is, to become more self-reflective and intentional in their dreaming as the result of an appropriate experimental manipulation, the results of study 1 in chapter 2 suggest the difference between them would be expected to decrease.

The laboratory investigation of unmanipulated baseline dream self-reflectiveness (Purcell et. al., 1986) found mean differences due to sleep stage and frequency of dream recall, but no differences on the basis of gender. Study 2 from the same paper manipulated self-reflectiveness and to a lesser extent, dream control, but did not use sex as a moderator variable when assigning subjects to groups. The differential effects of gender on baseline dream control appear to be demonstrated, but gender effects on the educating of attention toward dreaming are less clear due to gender inequality in group composition. This chapter presents a review of the empirical literature and derives experimental expectations on the basis of these individual difference variables, both for baseline levels of dream self-reflectiveness and dream control, and for the information transfer or carryover effects across states due to experimental manipulations similar to some used by Purcell et. al. (1986). This discussion will lead to the experimental design of Study 2, presented in Chapter 4.

Dream Recall Frequency.

Recall frequency and dream self-reflectiveness. More research has investigated the personalities and cognitive styles of high versus low frequency recallers than has investigated the differences in their actual dreams (Cohen, 1979). Most personality differences between high and low recallers account for very little variance in recall frequency (Cohen, 1974; Corey, Ormistan, Simmel and Dainoff, 1975; Wells, unpublished data). Rather, differences seem more attributable to variations in cognitive style (Gackenbach, 1978; Schonbar, 1965; Snyder and Gackenbach, 1986; Witkin and Lewis, 1967, p. 156).

The waking therapeutic process through which dream self-reflectiveness increases (Hendricks and Cartwright, 1978; Rossi, 1972) is seen as a process of increasing psychological differentiation, a process for which high frequency dream recallers appear to show a greater proclivity both in waking and dreaming. While awake, they show a tendency to be field independent compared to low recallers (Goodenough, Witkin, Lewis, Koulack and Cohen, 1974; Lewis, Goodenough, Shapiro and Slesar, 1966; Schonbar, 1965) and to have a lower threshold to perceiving human movement on a Rorschach type task (Schonbar's 1965 measure of psychological differentiation). They show cognitive flexibility in the form of divergent thinking (Austin, 1971; Sheldrake and Cormack, 1974) and creativity in the

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remote uses test (Bone and Corlett, 1968). In addition, they had a strong sense of control over and responsibility for their own lives compared to low recallers (Schonbar, 1965).

Cory et. al. (1975) found that frequent dream recallers did significantly better than infrequent recallers on tests of short term, long term and incidental aspects of visual memory. It is not known whether these abilities differentially affect the responses of high and low frequency recallers to mnemonic devices such as cued rehearsal of schemas to be activated during dreaming, that is, to a Mnemonic condition such as used in Study 1. Such analyses as could be done did not support the idea that differences in visual memory are a significant source of variation in learning to dream self-reflectively (Mnemonic treatment), although they may be in Baseline and Contrast conditions.

Cohen's (1979, p. 161) view of this research is consistent with Rossi's (1972) dialectical theory and Purcell's (1986) interpretation, namely that skills and habits of dream recall are largely 'psychodynamically neutral' and are a product of an educated attention to dreaming consistent with attitudes and habits developed during socialization. In his large twin study, Cohen (1979, p. 161) shows the strength of environmental influences on dream recall frequency relative to genetic ones. The importance of socialization in addition to hereditary

factors was shown for monozygotic twins (54 pairs), same sex dizygotic twins (34 pairs); same sex siblings (32 pairs); and same sex friends (42 pairs), since in all subject categories there was greater similarity in dream recall frequency when living together than when living apart.

Less is known about the biological aspects of dream recall frequency. Moffitt et. al. (1982) have demonstrated that high and low recallers are quite different on complex EEG measures both pre- and post-awakening and whether or not they could recall a dream. Armitage (1986) found that high frequency dream recallers, especially females, are better able to maintain the integrity of rhythmical cortical processes across the sleep/wake boundary than are low recallers, as measured by EEG. Low recallers seem to experience a greater state change or discontinuity between sleeping and waking (Moffitt and Hoffmann, 1986).

The greater continuity of biological processes from sleeping to waking in high recallers may be associated with greater information transfer in the form of dream recall. In Hartmann's (1984) terms, the boundaries between states in high recallers appear to be more permeable to the flow of information, the function of which, according to Rossi (1972) is that the states have the benefit of shared access to such information. (It should be noted that according to Hartmann, permeable boundaries are no benefit to a nightmare sufferer).

Whether or not these factors help in accounting for the cognitive style differences found between high and low frequency recallers is too soon to say. Still, it is logically appealing to link the cognitive flexibility associated with high recall with the habitually transferred dream information, as Rossi (1972) does.

In dreaming, high recallers show greater self-reflectiveness (Purcell et. al, 1986), and possibly a greater tendency to dream lucidly, (Snyder and Gackenbach, 1986). Baseline levels of dream self-reflectiveness in high and low frequency recallers have been documented experimentally only by Purcell et. al. (1986) to the author's knowledge. However, there is consensus that lucid dreaming is highly self-reflective dreaming (Cohen, 1979; Foulkes, 1985; LaBerge, 1985; McCarley and Hoffman, 1981; Rechtschaffen, 1978; Snyder and Gackenbach, 1986; Tholey, 1983). Surveys in the psychological and parapsychological literatures (Gackenbach, 1978; Kohr, 1980; Palmer, 1979;) regularly associate lucid dreaming with high frequency of dream recall (an exception is Blackmore, 1982). Both these are correlated with other parapsychological phenomena such as out-of-body and near-death-experience (Gabbard and Twenlow, 1984; Kohr, 1980; Schapiro, 1976). While there is no clear interpretation of these correlations, they are consistent with findings by Schonbar (1965) and Wallach (1963) that high recallers are more sensitive to their inner

states. This latter concept is what Snyder (1970) calls a 'cultivated introspection', and what Rossi (1972) refers to as 'attention' directed to dreaming. Education of this 'sensitivity' to notice (differentiate, disembed) is the basis of Purcell's experimental manipulations.

A related finding by Hendricks and Cartwright (1978) is that field independent subjects have a higher experiencing level in their dreams. The Experiencing scale they used was adapted from the one developed for psychotherapy process measurement by Klein, Mathieu, Gendlin and Kiesler (1970). This scale is concerned with feeling expression and symbolization in awareness, the therapeutic processes central to client-centered therapy (Rogers, 1958). These processes are subsumed under the scales used in the present research, symbolization in awareness being a self-reflective process and feeling expression an aspect of intentional dreaming.

In summary, the research literature is mildly predictive of a difference in baseline dream self-reflectiveness between high and low frequency dream recallers. There is also evidence that both types of subjects would be responsive to training designed to increase dream self-reflectiveness by entraining the mechanisms of attention on information transfer across the sleep/wake boundary.

Recall frequency and dream control. The notion of

greater cognitive flexibility in high recallers is supported by other research on dream dominance and frustration. Sheldrake and Cormack (1974) collected the dreams of both male and female convergers and divergers (a measure of cognitive flexibility) over a three month period. Divergent thinkers had twice as many dreams as convergent thinkers, a differential which is even greater than is usually found between high and low recallers in laboratory dream studies (e.g. Moffitt et. al., 1982; Purcell et. al., 1986). As discussed in the previous section, cognitive flexibility is highly correlated with frequency of dream recall, as found by other researchers (Austin, 1971; Bone and Corlett, 1968; Orlinsky, 1966). Interestingly, the high recallers/divergent thinkers had greater dream 'dominance' than low recallers/convergent thinkers. Dominance is Hall and Van de Castle's (1966) category, which refers to a dreamer being directive, in control, or an aggressor. The association of cognitive flexibility, high dream recall frequency and state independent cognition is particularly noticeable in the data for female subjects, since the frequencies of dominance and frustration themes were tied to the menstrual cycle in the low recallers. These subjects fluctuated dramatically within the cycle, showing consistent periods of dreaming with low dominance and high frustration. These fluctuations did not occur in those females who were high recallers/divergent thinkers. The state dependent cognitive behavior of the low

recalling females is strongly contrasted with the 'state independent' behavior of the more cognitively flexible high recalling females. In this study of dreaming, the observation of greater continuity across state among high recallers is suggestive of learned 'top down' processes which modify certain effects of more autonomous psychobiological processes. In other words, the high recallers may have learned a more flexible range of accessible dream behavior through the mechanisms of attention and information transfer.

These findings are predictive of greater dream control in high recallers than lows, and that lowest levels of dream control could be expected from female low recallers. The findings additionally support the implication that high recallers have the cognitive flexibility to transfer skill or operativity developed in one state for use in another, accounting for the 'state independence' of their dream cognition or, female high recallers' freedom from constraint by the menstrual cycle. Low recallers seem to demonstrate dream behavior which is more constrained by state. In other words, low recallers appear to show less transfer of operativity.

The findings by Sheldrake and Cormack (1974) are tantalizing, but methodological limitations were such that additional support is required from other research. Theirs was a small N study which violated assumptions of

independence by reporting frequencies in dreams without referring to dreams within individual subjects. There was also no experimental manipulation to test how modifiable these differences are. Still, the study generates clear, if tentative hypotheses for the present research.

As noted in chapter 2, dream control, or intentional dreaming as it is called in this paper (after Wallin, 1977), refers to the processes of involvement, expressiveness, intention and mastery manifested by the dream ego. It does not refer to the relatively abandoned (Tart, 1979) pre-sleep control of dream content paradigm, or the incorporation of pre-suggested content elements (e.g. Belicki and Bowers, 1982; Cartwright, 1974; Garfield, 1974; Griffin and Foulkes, 1977). The one-to-one mapping from waking to dreaming of recognizable day residues is far less likely to produce statistically frequent effects or changes which are salient or purposive for the dreamer, than the entraining of a dream process which can apply to many dream generated scenarios. This factor could well underlie the qualified failure of the content-control paradigm as evaluated by Tart (1979) in his review of the area, although Cohen (1979, p. 227) and Weiss (1986) note general success in getting subjects to dream on a suggested topic.

Tart additionally noted that success and failure of the content paradigm were seldom evaluated as a function of individual differences. One exception was a large study

(N=70) by Hiew (1976, cited in Domhoff, 1985, p. 85) wherein success in dreaming on a suggested topic was correlated with positive attitude toward dreaming, tendency to be introspective, and higher frequency of dream recall.

The failure to adequately specify subject characteristics so that dream intentionality can be attributed to systematic differences between individuals is equally true of studies of lucid control (Hearne, 1982; LaBerge, 1985), and of so-called Senoi type responses to dream contingencies (Doyle, 1984; Greenleaf, 1973). One exception is a careful study by Wallin (1977) who ordered his seven subjects hierarchically in terms of their dream recall frequency over a ten week period. Three high recallers, two mid-range recallers and three low recallers without exception comprised high, moderate and low success groups in acquiring Senoi type intentional dreaming. This small study provides a classic case of the role of recall frequency in experimental success with dream control entrainment. It suggests that the baseline differential between high and low recallers will be sustained throughout their response to treatments designed to enhance dream control processes. In contrast, the results of Study 1 in Chapter 2 suggest that the differences in dream control between high and low frequency recallers are attenuated when attention is entrained to these processes.

An additional factor which plagues studies of most

variants of the dream control construct is that of scaling. In chapter 2 the argument was presented that human effectiveness in situations is a matter of degree covering a wide range of possibilities. A frequency count of presence or absence of control is far too simplistic and insensitive and may amass Type II errors in research. Attention to individual difference variables such as sex and dream recall frequency, in addition to continuous scaling would be tonic to this research area.

Gender.

Generally speaking, theories of dreaming seldom make reference to a theory of sex differences in dream quality or function, although content differences are posited by Freud (1900) and Jung (1974). Empirically, certain kinds of sex differences in dream reports are well known. For example, males report more dominance (Hall and Van de Castle, 1966) or 'agency' (Trupin, 1975) themes, while females report more relationship or 'communion' themes, in accordance with what are the traditional waking roles and preoccupations of the sexes (Foulkes, 1979; Gilligan, 1982; Hall, 1984). These results are consistent with most dream theories which stress a continuity of content and process across sleeping and waking (e.g. Corriere et. al., 1980; Gendlin, 1986). These views also allow for the amelioration of gender differences in dreams as culture allows for the broadening of social roles (Koch-Sheras cited in Weiss, 1986, p. 22). For

example, the concept of androgyny (Bem, cited in Valle and Kruger, 1981, p. 384; Jung, 1968, p. 174; Singer, 1977) suggests that psychological differentiation is associated with increased development of both masculine and feminine traits in the same person. It should also be noted that other researchers find distinctive differences in masculine and feminine differentiation, as for example with Gilligan's (1982) findings regarding moral development.

The self-reflectiveness scale is generally indifferent with regard to sex roles and the control scale was designed to subsume both the agency and communion styles of relating to the world. Therefore, gender is used in this research project less as a theoretically critical variable and more as a moderator variable which controls variation due to gender in a statistically manageable way.

Most expectations about gender differences are rooted in the empirical literature.

Gender and dream self-reflectiveness. While males are said to be more field independent than females on the rod and frame test, other tests of disembedding reveal less clear sex differences (see Witkin and Goodenough, 1981, pp. 66-68 for a review). Gackenbach's work suggests an association of highly self-reflective dreaming with field independence for both sexes. The Purcell et. al. (1986) laboratory study revealed no tendency for self-reflective dreaming to be related to gender, nor on a gender by recall

frequency interaction from any sleep stage. One hypothesis is that changing sex roles and child rearing practices are blurring some of the distinctions between the sexes established in the older research on field independence (Koch-Sheras cited in Weiss, 1986, p. 22; Witkin and Goodenough, 1982, p. 82).

It is common for High and mid-range frequency recallers only to be used in dream research (Urbina, 1981), and for one sex only to be used (e.g. Moffitt et. al., 1982; Snyder, 1970), a factor which limits the amount of data available on these individual difference variables. Since gender was not used as an independent measure in Study 2, the relation between gender and response to treatment designed to increase self-reflectiveness remains unclear. However, the overall means for males and females are not different. The author knows of no study which suggests that a differential response to treatments designed to educate attention to dreaming would emerge on the basis of gender. In general, the research gives little support to a predictable sex difference in dream self-reflectiveness. This does not preclude the sexes having different content priorities (e.g. Winget, Kramer and Whitman, 1972) which do not affect levels of dream self-reflectiveness.

Gender and dream control. The situation is more complex for the relationship between gender and dream intentionality. Sex differences in dream content, if not in

dream processes, have been popular research preoccupations (e.g. Hall, 1984; Hall and Van de Castle, 1966). As was discussed in Chapter 2, these findings are constrained by scaling limitations. However, according to several authors (Cohen, 1973; Hall and Van de Castle, 1966; Winget, Kramer and Whitman, 1972), males are more aggressive in their dreams, and show more dream dominance than females (Sheldrake and Cormack, 1974). The data in Study 1, Chapter 2 concur with these findings. While group composition varied with respect to gender, it was still found that males had higher dream control means in every group. On the other hand, Brenneis (1970), in a sample of 193 college students found that women's dreams less often contained events which were beyond the dreamer's control, and more often opposed a restraining force. One difficulty in interpreting Brenneis' results however, is that the scored actions are of the central dream figure which in females was more often someone other than the dreamer. The superior dream control in females in this study may be artifactual.

As with study 1, research in which within-dream intentionality has been enhanced using Senoi type techniques (e.g. Doyle, 1984; Wallin, 1977) has not used gender as a variable.

The control scale developed in Chapter 2 subsumes in many ways the agency/communion distinction between the dreams of males and females (Trupin, 1975), or between

people of masculine or feminine sex role orientations (Cohen, 1973). Since both mastery-assertiveness and feeling expressiveness increase with scale scores, this standard male/female style difference (Carlson, 1971) is not expected to bias dream control scores. In addition, it is not known to what extent feminist values will have modified women's (and men's) dreams in the decade or more since most of these studies were conducted (Koch-Sheras cited in Weiss, 1986, p. 22). Nonetheless, the research literature in general supports greater baseline dream control in males than in females. No tendency for these differences to be attenuated by experimental manipulation has been reported, to the author's knowledge.

Transfer Effects.

An early conceptualization of transfer effects from waking to dreaming was that of 'day residues' (Freud, 1900), later researched as 'incorporation of stimulus elements' (Tart, 1979). More recent research has laid the ground for a much stronger conceptualization of information transfer across the sleep/wake boundary (e.g. Laughlin, McManus, Rubenstein and Shearer, 1986), as discussed in Chapter 1. Dreaming can be entrained upon a pre-defined topic (Belicki and Bowers, 1982; Delaney, 1979; Domhoff, 1985), sometimes telepathically (Child, 1985; Ullman Krippner and Vaughan, 1973). Meta-cognitive processes (Kitchenner, 1983) of self-reflectiveness (Purcell et. al., 1985; Rossi, 1972) and

control over dream behavior (Doyle, 1984; Wallin, 1977) can be learned through attention patterning schemas. Most dramatically, entire plans of action and waking memories can be transported from waking into the dream drama in experienced lucid dreamers (Green, 1968; LaBerge, 1985).

It can be argued that any theory which depicts dreaming as functional to the human being is implicitly a systems theory superordinate to waking and sleeping domains. The systems tenets of co-determination (Maruyama, 1963) or co-implication and co-evolution (Von Bertalanffy, 1968; Maturana and Varela, 1970) then apply within dream theory such that conscious organization is a mutually caused product of the conscious interaction of dreaming and waking experience. Rossi's (1972) dialectical theory of dreaming is explicitly such a system of co-evolution. There has however been a dearth of empirical work which examines dreaming and waking from this perspective (Cohen, 1979, p. 271).

While it seems clear that the idea of dream isolation has been greatly overstated, the other side of the coin concerning transfer or carryover effects from dreaming to waking are definitely under-researched "in the light of all the theoretical speculation about what dreams are supposed to accomplish" (Cohen, 1979, p. 271).

Rosalind Cartwright frames the questions of transfer effects this way:

"Waking mental life can operate in any number of modes, receiving and retrieving data from different sources in different combinations. Do these differences have consequences for how night time thought is distributed, and does this in turn affect the deployment of attention in the subsequent waking activity, or are these independent non-interactive states? Are the affective memory schemas reorganized on the basis of the endogenous experience of the dreams or are these state-dependent systems? Are there dream residues as well as day residues and where should we look for their effects?" (In Fishbein, 1980, p. 244).

Like Cartwright, many researchers (e.g. Cohen, 1979, p. 164; Kramer, 1982; Sirois-Berliss and De Koninck, 1982; Wasserman and Ballif, 1985) emphasize the affective carryover effects of dreaming. Foulkes (1982) has noted that dreams generate experience which provides the dreamer with the opportunity for an affective response, rather than affect causing the dream (Freud, 1900). To follow through on Foulkes' conclusion, symbolization in dream awareness of the affective response (Hendricks and Cartwright, 1977) constitutes cognitive operativity developed in the dream state that is available to the waking state through the mechanism of attention to the recalled dream (Hall, 1986; Rossi, 1972).

Cohen (1979, p. 271) notes that waking tasks which measure carryover effects from dreaming to waking are as yet undeveloped (mood carryover is an exception, e.g. Sirois-Berliss and deKoninck, 1982). As Weiss (1986) and Foulkes (1985) have pointed out, REM deprivation has been the dominant paradigm for investigating such effects by inferring them from behavioral deficits. This approach is

Figure 4.7.a. Weekly means on Dream Control scores for
HIGH recallers in each group (n=52).

Figure 4.7.b. Weekly means on Dream Control scores for
LOW recallers in each group (n=24).

methodologically problematic and has been disappointing in terms of information yield (see Foulkes, 1985 for a review). Another more direct approach might be to use dreams and subjective reports of dream transfer effects as data, thus evaluating the less systematically collected impressions of clinicians regarding specific kinds of transfer effects (e.g. Delaney, 1979; Rossi, 1972). Doyle (1984) has shown that the dream operativity taught to subjects enabling them to have more pleasurable dreams, an aspect of dream control, was still in effect at a six month follow-up. Wallin (1977) found that subjects who were successful in changing their dreaming along Senoi lines differed from unsuccessful subjects on post test questionnaires in that they had dramatic experiences of insight during the study. Successful subjects experienced a reduced discrepancy between images of self and self-ideal. They found they wanted less control from, and over others and found greater ease in interpersonal relations. Again, these effects were still present at a follow-up interview.

Cohen (1979, p. 271), Delaney (1979) and Garfield (1974) all suggest dream incubation as a good possibility for obtaining effects from dreaming to waking. In Delaney's training groups, she notices how flexible dreams are in responding to entrainment originating from normal waking consciousness and from the hypnagogic period. This is the transfer of operativity from waking to dreaming illustrated

by other researchers (Doyle, 1984; Purcell et. al., 1986; Wallin, 1977). Delaney has also noted the return effects from dreaming to waking such that dreams can answer questions, provide creative ideas and solutions, rehearse skills needed in waking, ~~and generate insight~~, in addition to moods.

The results in Chapter 2 indirectly suggest that greater transfer effects from waking to dreaming and back to subsequent waking have occurred for high frequency recallers than low recallers. On the other hand, when high and low recallers are taught to facilitate such effects, both succeed. In other words, differential transfer effects appear to have occurred in Study 1 although subjects were not asked directly about them.

High frequency recallers clearly have more opportunity for such transfer effects from dreaming to waking, and this could be expected to show in a baseline condition after dream collection. It is expected that differential transoperativity effects from increased attention to dreaming would be seen and that high and low frequency of recall during the course of an experiment would determine the degree of effect more so than would pre-experimental self-reported recall frequency. Dreaming to waking transoperativity effects should be greatest in the treatment condition with the most attention entrainment mechanisms.

Summary.

The research literature converges on the notion of bi-directional transfer or carryover effects shown by high recallers across sleeping and waking, and suggest some link between field independence and state independence since they seem to appear in the same subjects. It is likely that frequent practice in transfer of information across state boundaries as occurs in frequent dream recall, increases boundary permeability and sleep/wake continuity facilitating cognitive flexibility and psychological differentiation in both dreaming and waking. This 'divergent' cognitive style appears to be largely the product of a differential socialization. It is expected that the high /low differences in baseline dream self-reflectiveness found by Purcell (1986) could sustain replication. This difference would likely become ameliorated by appropriate training for both types of subjects, although actual recall frequency during the experiment would be an important factor. It has been noted by several experimenters that low recallers sometimes become high recallers during such experiments (e.g. Domhoff and Gerson (1967)). Consistent with this observation, Purcell et. al. (1986) reported high correlations between self-reported and observed recall frequency in baseline subjects, and low correlations in experimental subjects.

There is little reason to hypothesize sex differences

in dream self-reflectiveness, but evidence does favour higher dream control for males irrespective of experimental treatment.

CHAPTER IV

Study 2

This chapter is an investigation of the the transfer of skills and information across the sleep/wake boundary with particular reference to the meta-cognitive processes of self-reflectiveness and dream control. These transfer effects were designed to occur through the mechanisms of waking attention patterning and were expected to appear most noticeably in the dream reports of those subjects who are most open to such transfer effects. It was anticipated that high dream recallers would experience greater transfer effects than low dream recallers and that educated attention (treatment) would also result in increased transfer effects. Greatest effects were expected for female high recallers with training, and least effects for male low recallers without training.

The aim of this research was to extend the empirical and theoretical reach of the studies of Purcell et. al. (1986) and of Study 1 in Chapter 2. The strategy was to combine and extend three of the experimental treatments and the advantage of high dream yield from the home recall study, with the individual difference variables of recall frequency and gender, from the baseline laboratory study. Each treatment group contained at least 24 subjects in order to accomodate analyses of individual difference patterns

both within and across treatment conditions. The total N was required to be at least 72 subjects, who in a three week period have been found to generate close to 9 dreams each. It was expected that approximately 600 dreams would be reported, a sufficient number to sample adequately the range of the phenomena under investigation. The three week period was thought to be required to enable 1) the teaching and learning of self-reflective and dream control skills, and 2) to provide subjects with a sufficiently lengthy experimental period to enable the post-experimental, subjective evaluation of transfer effects, if any, from dreaming to waking.

This experiment was aimed at illuminating the processes of dream self-reflectiveness and intentionality within the dream ego, first as base-levels, second as responses to an attention-placebo aimed at focusing attention on detailed dream recall, and third, as responses to manipulations designed to predispose attention to notice specific dream processes when they are occurring. Increased 'noticing' (dream self-reflectiveness) sets the stage for increased levels of behavioral regulation. Differential patterns of response were expected to emerge as a function of treatment condition, of gender and of self-reported frequency of dream recall, and of their interactions.

Method.

Subjects. Subjects were recruited from a large

population of psychology undergraduates who required experimental participation credits. On the basis of an initial questionnaire (Appendix C) given to 445 students, 72 respondents were selected such that 36 were high frequency dream recallers (4 times a week or more) and 36 were low frequency dream recallers (once a week or less). High and low frequency recallers were equally comprised of males and females. Twenty-six additional subjects were run to compensate for any attrition, mostly high recallers since low recallers were relatively rare (20.2% of respondents) and were less inclined to volunteer. Three subjects withdrew so that 95 subjects completed the experiment: 27 high males, 27 high females, 22 low males, and 19 low females.

Instruments.

1. Initial Questionnaire (Appendix C). The purpose of this instrument was to elicit limited demographic and pre-test information to facilitate subject selection and assignment to groups on the basis of gender and self-reported frequency of dream recall. The query regarding recall frequency is embedded among items about other aspects of dream experience so that subjects will not guess the criteria for subject selection. These extra items are also useful for post-hoc analyses since they are general queries about habits of attention to dreaming and awareness of transfer effects that can be correlated with subjects' post-experimental ratings of such effects. Individual subject self-reported

pre-test levels on: 1) habits of attention to dreaming, (composite score, sum of items 1,2,9); 2) experience with lucidity and pre-lucidity, (composite score, 3,5,6,8); 3) dreaming to waking transfer effects, (item 9); and 4) an overall level of 'dream-ability' or predisposition to the experiment, were calculated by summing all scores on the questionnaire.

2. Group Embedded Figures Test (GEFT) (Oltman, Raskin and Witkin, 1971). This group paper and pencil test was administered 2 weeks prior to the experiment as a measure of psychological differentiation.

3. Self-consciousness Scales (Fenigstein, Scheier and Buss, 1975), (see Appendix D). Three subscales of this questionnaire are, Private Self-consciousness, Public Self-consciousness and Anxiety. The questionnaire was administered at pre-testing sessions 2 weeks before the experiment. The scale of interest here was Private Self-consciousness, which was expected to related to various indices of attentiveness to dream experience.

4. Report skills questionnaire (Appendix E). This is a training instrument designed to remind subjects about detailed dream reporting and thereby cultivate general attentiveness to dreaming. Items query the presence of various kinds of dream detail such as color, speech and emotion. This instrument appears on the reverse side of dream log sheets for subjects in Attention Control and

Schema groups. They are asked to fill out the questionnaire for each dream report.

5. Dream self-reflectiveness scale (Appendix A contains the complete scale and manual. Table 2.1 presents a brief version of this scale.) This instrument was used by judges to score all dreams on self-reflectiveness.

6. Dream control scale (Appendix B contains the complete scale and manual. Table 2.2 presents a brief version of this scale). This instrument was used by judges to score all dreams for level of dream control.

7. Dreaming to waking transfer effects (Post-test). (Appendix F). These items were extracted from Delaney's (1979) appendix which discusses the keeping of a dream diary. Items query the effects of dreaming on subsequent waking, which subjects rate on a scale from 1-7. A total score for each subject was obtained by summing the rating from each question (maximum=70). Ratings on individual items were used as scores in order to evaluate the effects of different types of transfer effects. No groups were tutored in these items or had such effects suggested to them. Still, the items may be considered 'leading', and so are not considered an absolute measure of transfer effects. Rather the questions are aimed at establishing group differences at post-test. This pilot instrument is designed to gather preliminary data on what kinds of dreaming-to-waking transfer effects subjects themselves report noticing, with

the expectation that such effects are more noticeable to subjects who have attended most to dreaming. This kind of information is an important precursor to development of tasks through which subjects might demonstrate carry over effects from dreaming to waking.

It was decided that it was unnecessary to disguise from subjects the obvious purpose of the questions, that is, the carryover effects from dreaming to waking, for two reasons. One was the unlikelihood of being able to do so after an experiment which is very intensively about dreaming. Another was the protection afforded by a randomized research design with control groups (Campbell and Stanley, 1963) such that the information about differential carryover effects resides in the differences in group scores. With this design protection, the contaminating effects of a pre-test are avoided.

8. Compliance Questionnaire (Appendix G). These items were completed at post-test and measured the degree of cooperation self-reported by Schema subjects (Score = item #1/10 + #2 - no. missed sessions).

Procedure.

Subjects were divided into 4 sets: male high frequency recallers; female high frequency recallers; male low frequency recallers; female low frequency recallers. Each set was randomly assigned to 3 groups, such that each group

had at least 24 subjects:

	male	female

high	n=6	n=6
low	n=6	n=6

All groups had additional subjects to compensate for possible attrition, although only three subjects withdrew. The 3 conditions were Baseline, Attention Control and Schema groups, similar to those described in Study 1, Chapter 2, but with several modifications to previously developed treatments (Purcell et. al., 1986). Details of treatment conditions are documented in Appendix H. Greater emphasis was placed on the entrainment of dream control in the Schema group and also the elimination of any suggestion of dreaming to waking transfer effects in all groups. Handouts were given to treatment subjects in order to increase the efficacy of treatment sessions and thus compensate for the increased treatment load without extending the session time. Baseline subjects were required to report to the experimenter weekly instead of just at the end of the experiment, in order to maintain dream reporting in these subjects. Similarly, treatment subjects always had to make up missed sessions. This was done in person rather than over the phone, since the latter may inadvertently encourage less participation. Pre-testing was also added for all subjects. The two week space between pre-testing and the experimental period was included to diminish any biasing effects of these

tests, particularly on Baseline subjects. Post-testing for dreaming to waking transfer effects was also introduced.

All subjects were asked to write home dream reports for a three week period. They were told that any experience during sleep constitutes a 'dream' in order to override privately held definitions of the term. In order to avoid a response bias on the basis of social desirability, subjects were told that the experimenter was investigating dreams as they actually occur, and that any editing to make dreams more coherent or presentable was contrary to experimental purposes. Subjects were asked to avoid discussing the experiment with other participants until after the data collection period, at which time they filled out the post-test and were debriefed. Differential instructions for groups were as follows: (Appendix H has greater detail).

Baseline (B): (n=32; 9 high males, 9 high females, 8 low males, 6 low females). Subjects were asked to keep a dream log without further instruction. They were given dream log sheets without a questionnaire on the reverse side. Subjects met with the experimenter once a week, long enough only to hand in the week's dream reports and collect additional log sheets as needed. At the end of 3 weeks they handed in their final dreams, filled out the post-test on dreaming to waking transfer effects, and were debriefed as to the purposes of the experiment.

Attention Control (C): (n=30; 9 high males, 8 high females, 6 low males, 7 low females). In addition to dream collection, subjects were asked to fill out a report skills questionnaire on the back of each dream report. Weekly half hour meetings with the experimenter dealt with detailed reporting of dreams and answering questions subjects had about making their reports.

Schema (S): (n=33; 9 high males, 10 high females, 8 low males, 6 low females). In addition to dream collection subjects filled out a report skills questionnaire for each dream during week one, a dream control questionnaire during week two (Appendix H) and a self-reflectiveness rating scale during week three (Appendix A). Subjects also wore a leather bracelet during the experimental period which served as a cue for schema rehearsal whenever it was noticed during the day. Schemas were learned at weekly half hour meetings with the experimenter and were given as handouts. The first schema involved questioning the present state of consciousness, whether waking or dreaming, and reminding oneself that this same question can be posed during dreaming. Further schemas, elaborated in Appendix H, were designed to predispose the subjects' attention toward noticing certain targeted dream situations and processes (i.e. to learn to notice oddities, and to notice opportunities for choice in behavioral expression). At the same time as the post-test, subjects in this group wrote

answers to questions about their degree of compliance with the experimental requests.

Scoring of dream protocols. A training set of 50 dreams was used to train 4 judges, 2 for each of the Self-reflectiveness and Control scales. The experimenter was the third rater for each scale. The dreams collected during the experimental period were typed with minor editing. This was felt necessary because treatment subjects had a tendency to discuss aspects of their dreams at the end of the report which reflected treatment discussions or questions on the reverse side of the report. Since this verbiage was not part of the actual dream report, it was eliminated so as not to artificially inflate word counts. Reports were shuffled, and given to raters with no identifying labels. After scoring the dreams in blocks of 200, judges met to submit their ratings and to discuss the expected 10% -15% which did not meet the scoring criterion of exact agreement by 2 out of 3 judges on the first independent round. Dreams not easily agreed upon by this procedure were given the score accorded by the middle judge although the option remained open to report a dream as unscorable and omit it from the data analysis if this seemed more appropriate. Regular meetings provided judges with feedback as to their consistency with other judges, and prevented personal scoring biases that can amplify with time in the absence of such feedback. At the

same time, independence of ratings is maintained.

Hypotheses.

The theoretical and empirical literatures —support predictions regarding main effects of treatment and the aptitude of dream recall frequency, for both dream self-reflectiveness and dream control.

A third dependent measure of dreaming-to-waking transfer effects taken at post-test is a preliminary instrument, and therefore not a primary focus. It is however of theoretical interest and sustains theoretical expectations consistent with the predicted main effects.

While gender was not of primary theoretical interest, the research literature suggests that gender is a possible moderator of some experimental effects. Gender is used here as an independent variable in order to control this variance statistically, to explore the effects, and to serve the goal of replicability. For these reasons, some data-based expectations were held.

The empirical literature is marginally predictive of some second order interactions, and these are tentatively put forward where there are precedents. At the level of second and third order interactions, this experiment is mostly exploratory, and the interactions will serve to explicate the main effects,

Hypothesis 1. Main effects of treatment:

A. It was expected that as attention to dream processes increases, dream self reflectiveness scores would increase.

i. Significant group differences were predicted for mean self-reflectiveness scores. This mean was expected to be highest in the Schema group, followed by Attention-control, then Baseline groups.

ii. The Schema treatment was expected to produce significantly more lucid dreams from more lucid dreamers than Baseline and Attention Control conditions.

B. Similarly, dream control was expected to increase as a function of learning to notice opportunities for alternatives in behavioral expression, during waking attention to dream contingencies.

i. The Schema group was expected to have significantly higher dream control scores than Baseline and Attention-control groups.

C. It was tentatively expected that group differences on the transoperativity post-test would be significant. Mean scores were anticipated to be highest from Schema subjects, followed by Attention Control, then Baseline subjects.

To the extent that Hypothesis 1 is supported by the findings, the transfer of operativity from waking to dreaming and from dreaming to waking is demonstrated. If these effects did not reach significance, the results would support a more 'isolated' view of complex dream processes.

Hypothesis 2. Main effects of dream recall frequency:

A. It was predicted that there would be a significant overall effect for frequency of dream recall.

i. For dream self-reflectiveness, high recallers were expected to have significantly higher scores than low frequency recallers.

ii. For dream control, high recallers were expected to have higher scores than low recallers.

iii. For dreaming-to-waking transfer effects, high recallers were expected to have higher scores than low recallers.

To the extent that Hypothesis 2 is confirmed, the mechanism of attention to dream processes (through the recalled dream), can be seen to mediate the transfer of operativity from waking to dreaming. If high/low effects were not significant, increased waking attention to dreaming could not be seen as an important mechanism of information transfer.

Hypothesis 3: Main effects of Gender:

A. It was tentatively hypothesized that males would have higher overall dream control scores than females. No main effects of gender were anticipated for other dependent measures.

To the extent that Hypothesis 3 is a finding, it supports a

stable gender difference in dream control irrespective of style differences between the sexes. If this gender difference were not found, this would argue against the existence of a stable gender difference in intentional dream processes.

Hypothesis 4.* Treatment by recall frequency interaction:

A. It was tentatively hypothesized that Baseline differences in the dream self-reflectiveness, dream control, and dreaming-to-waking transfer effects would attenuate as a function of increased attention to dream processes.

- i. Mean differences in dream self-reflectiveness between high and low recallers which were expected to be significant in the Baseline group, were not expected to be significant in the Schema group.

- ii. Mean differences in dream control between high and low frequency recallers which were expected to be significant in the Baseline group, were not expected to be significant in the Schema group.

To the extent that Hypothesis 4 is confirmed in the data, it suggests that the transfer of waking operativity to dreaming, through the education of attention, is a powerful learning tool in destabilizing a bio-psychological trait difference. If this interaction did not occur and high and low differences were maintained across treatments even though both types of subjects responded to treatment, it

would suggest that the bio-psychological aptitudes associated with dream recall frequency are stable.

Implications of Findings.

The findings have implications for important aspects of general dream theory such as the issue of whether or not the executive functions of reflection and volition are suspended during dreaming. More specifically, the results evaluate the degree to which the meta-cognitive functions of self-reflectiveness and dream control appear in dream reports, both spontaneously and as a result of training.

The findings illuminate the issue of whether dreaming should be described as isolated from other systems of consciousness. If 'learning to dream' due to efforts during wakefulness is possible, this finding has implications for two somewhat incompatible conceptions of dreaming: 1) whether or not dreaming is reducible to unmodifiable biological events, and 2) whether state (dreaming) and trait (recall frequency) related behaviors are modifiable by top down processes (learning). To the extent that hypotheses are supported by the data, the basis for a conception of relative state/trait independence, achieved through learning may be advanced.

Results.

Scoring Reliability. Inter-rater reliability was considered satisfactory for nine-point scales.

1. Dream Self-reflectiveness Scale (DSR). Of the 1212 dreams that were collected, 1144 (94.4%) reached the scoring criterion on the first round of independent ratings. The remaining 5.6% were resolved by discussion. None of these dreams was considered unrateable. Table 4.1 shows the percentage of exact agreement between pairs of judges, as well as the Pearson correlation between their sets of ratings.

Table 4.1. Percentage of exact agreement and (Pearson correlations) between pairs of judges on the Dream Self-reflectiveness Scale.

	J1	J2	J3
J1	-	70.87% ($r=.76$)	69.14% ($r=.72$)
J2		-	68.56% ($r=.71$)
J3			-

Table 4.2 compares the scoring distributions for two judges of the Dream Self-reflectiveness Scale using the entire 1212 dream data set. This table shows the percentage of exact agreements along the diagonal. The bulk of errors are close to the diagonal, since most errors are ordinal close to agreements. Errors decrease in number with ordinal

Table 4.2. Degree of concordance of two raters for
DSR scale categories for 1212 dreams.

Judge 2

	1	2	3 *	4 *	5	6	7	8	9
1									
2									
3		*	*****	**	*****		**		
4			*****						
5			*****						
6			***						
7			*	***					
8									
9									

Note: * 10 dreams
- 5 dreams
Cells accurate to plus or minus 2 dreams.
DSR: Dream Self-reflectiveness

distance from the diagonal. Since dream self-reflectiveness is normally distributed, most errors are distributed around the frequently occurring mid-range categories. Relatively few dreams fall into categories 4 and 6.

2. Dream Control Scale (DC). On the first round of independent ratings, 1083 out of 1212 dreams (89.36%) reached the scoring criterion. The remaining 10.64% were resolved by discussion, and none were considered unrateable. Table 4.3 shows the percentage of exact agreement and the Pearson correlations between pairs of raters.

Table 4.3. Percentage of exact agreement and (Pearson correlations) between pairs of judges for the Dream Control Scale.

	J1	J4	J5
J1	-	58.30% ($r=.76$)	49.55% ($r=.72$)
J4		-	46.78% ($r=.69$)
J5			-

Table 4.4 compares the scoring distributions for two judges of the Dream Control Scale using the entire 1212 dream data set. This table shows the percentage of exact agreements along the diagonal. As with the Self-reflectiveness Scale, the bulk of errors are close to the

diagonal, since most errors are ordinarily close to agreements. Errors decrease in number with ordinal distance from the diagonal. Since dream self-reflectiveness is normally distributed, most errors are distributed around the frequently occurring mid-range categories.

Scale Properties. The typical normality of distributions of dreams in Baseline subjects for dream self-reflectiveness has been demonstrated elsewhere (Purcell et. al., 1986), and similarly for dream control (Chapter 2). The addition of category 7b to the DSR scale (wherein the dreamer self-reflects, examines or regrets his thoughts, feelings or behavior) resulted in no discernible distributional difference in DSR scale scores between the present study and Study 2 (Purcell et. al., 1986). In the present study, the selection of subjects from extreme groups (high and low frequency dream recallers) tends to interfere with the normal distribution of dreams across scale categories, although the distributions of subject means remain normal for both scales. In addition, cell variances remain homogeneous, including those in treatment groups. Figure 4.1 shows group distributions for Dream Control, such that lucid dream induction in the Schema group affects normality.

In support of the construct validity of lucid dreaming that lucid subjects had significantly higher mean scores on the Dream Self-Reflectiveness scale, when the lucid category

Table 4.4. Degree of concordance of two raters for DC scale categories for 1212 dreams.

Judge 2

	1	2	3	4	5	6	7	8	9
1	**								
2									
3			*****	***	*	+	+		
4			*						
5			***	*****	*****	***	+		
6			***	*****	*****	***			
7			***	*****	*****	***			
8			***	*****	*****	***			
9			***	*****	*****	***			

Note: * 10 dreams
+ 5 dreams
Cells accurate to plus or minus 2 dreams.
DC: Dream Control

(9) dreams were removed from subject means⁹² ($t = 2.70$, $p = .008$). Similarly, lucid subjects had significantly higher mean scores on the Dream Control scale when the lucid control category (9) was removed from subject means ($t = 1.98$, $p = .05$).

⁹² The DSR scale distributions for groups (Fig 4.2) is the same as occurred in Study 2 (Purcell et. al., 1986) in all but one respect. In that study, Baseline subjects performed differently, demonstrating a greater preponderance of category 3 dreams with a corresponding decrease of representation in all other categories. Consequently their DSR means were lower (3.66 as opposed to 4.61 in the present study) and the word counts of their dream reports were lower (65 as opposed to 102 in the present study). This outcome was anticipated by the experimenter and can be interpreted as due to a more carefully maintained motivation to participate in the present Baseline subjects. They were required to report to the experimenter once a week, at a designated time and place, with their dream reports, and to get new materials if necessary. Even though this constituted no treatment, it was thought to prevent the greater tendency to lapse in the quality of dream reporting when subjects do not need to report to the experimenter for a 3 week period. In contrast, the treatment groups' performance was more comparable in both studies given the differences in subject populations. The higher DSR score in the Mnemonic group

Figure 4.1. Distribution of dreams (%) across Dream Control scale categories for each group (n=1212).

Figure 4.2. Distribution of dreams (%) across Dream Self-reflectiveness scale categories for each group (n=1212).

(Study 1) were also perhaps due to the smaller size of discussion groups or to random sampling error. In the present study, groups were quite large.

Figure 4.2 shows that the greatest representation in category 7 is due to the Attention condition, and the least is due to the Baseline condition. Schema subjects demonstrate a pattern of good representation in category 7 (but less than Attention subjects) and greatest representation in category 9. This pattern is the expected one if subjects are using category 7 type insights to trigger lucidity, as they were taught to do. A later section on lucid dream phenomenology elucidates this pattern.

The correlation between the two scales over the 1212 dreams is .41 ($p < .001$). The degree of association varies with treatment condition, such that it is low in the most representative Baseline condition ($r = .32$, $p < .001$), vanishes in the Attention Control condition ($r = .09$, $p = .107$), and becomes more associated in the Schema condition ($r = .57$, $p < .001$).

Pre-test variables: Exploration of pre-experimental traits and individual differences.

There were no differences between groups on any pre-test measures, as would be expected when random assignment is used. Table 4.5 presents means and standard deviations for males, females, high and low frequency recallers on pre-

Table 4.5. Means (standard deviations) for pre-test variables.

Pretest measure	High	Low	Male	Female
Group Embedded Figures Test (possible score, 18)	13.57 (4.04)	12.15 (4.25)	14.17 (3.88)	11.72 (4.12)
Private Self- Consciousness Scale (†)	70.09 (15.77)	58.91 (10.76)	64.74 (14.04)	66.11 (15.89)
Attention to Dreaming (C; possible score, 13)	10.68 (1.49)	6.72 (1.26)	8.75 (2.35)	9.26 (2.47)
Lucid Tendency (C; possible score, 16)	10.74 (1.76)	8.40 (2.33)	9.77 (2.46)	9.72 (2.20)
Dreaming to Waking Transfer Tendency (possible score, 4)	2.76 (.87)	2.00 (.82)	2.44 (.90)	2.43 (.96)
Dream Ability (C; possible score, 49)	36.87 (3.24)	28.20 (4.04)	33.02 (5.40)	33.35 (5.86)

C: composite variables

Note: There were no group differences at pre-test.

test measures.

On the Group Embedded Figures Test, the anticipated sex difference was significant ($F_{1,82} = 9.626$, $p = .003$). Males had a mean score of 14.17 out of a possible score of 18, and females had a mean of 11.72. These means are slightly higher than the U.S. college student norms referenced in the manual, which were 12.0 and 10.8 respectively. The expected difference in scores between high and low recallers approached significance ($F_{1,82} = 3.222$, $p = .076$). The mean for high recallers was 13.57 and for low recallers, 12.15. When high and low categories of recall frequency were based on rates observed during the experimental period, the difference was not statistically significant. Private Self-consciousness Scale scores revealed a significant interaction between gender and recall frequency ($F_{1,81} = 3.969$, $p = .05$) such that high recallers report significantly more private self-consciousness than low recallers as a main effect ($F_{1,81} = 14.135$, $p = .001$), but that this difference is more dramatic for females than males. The means (expressed as per cents) are:

	high	low
male	67.13	61.67
female	73.06	55.69

When experimentally observed rates of recall define high and

low recallers, as opposed to self-report at pre-test, the main effect for recall frequency is significant ($F_{1,81} = 7.198$, $p = .009$, mean for highs, 69.52; mean for lows, 61.20), but gender has no effect at all. The observed scores for males and females were virtually identical to the norms published by Fenigstein et. al. (1975); 66.50% for females and 64.75% for males.

ANOVAs on composite variables extracted from Initial Questionnaire items were also performed to explicate the individual difference variables, gender and recall frequency. On all these variables, high recallers reported significantly higher levels than low recallers, whether self-reported or observed criteria for designating subjects as high and low recallers was used. No effects for gender occurred. Overall 'Dream-ability' is significantly higher for high recallers ($F_{1,82} = 124.08$, $p = .001$); habits of 'Attention to dreaming' are more extensive in self-reported high recallers ($F_{1,82} = 190.43$, $p = .001$); self-reported tendency to have lucid and pre-lucid experience is higher for high recallers ($F_{1,82} = 29.63$, $p = .001$); and the tendency to experience dreaming to waking transfer effects is reported more by high recallers than low recallers ($F_{1,82} = 18.09$, $p = .001$).

Summary of results for pre-test measures: Self-reported high frequency recallers demonstrated higher means on all pre-test measures than did low recallers. These results

tended to be slightly stronger when subjects were designated high or low recallers on the basis of their observed rates of recall, suggesting that this post-hoc measure is the more accurate one.

Tests of Hypotheses.

Analysis of variance for a $3 \times 2 \times 2$ factorial (group, gender, recall frequency) was performed for each of the dependent measures. Table 4.6 presents the means and standard deviations for the 12 cells of the $3 \times 2 \times 2$ factorial for the dependent measures. This same set of analyses was performed with a post-hoc median split of subjects into observed high and low frequency recallers. It was anticipated that the pre-experimental self-report index of dream recall frequency would bear a strong relationship to recall frequency observed during the experiment. This latter measure was obtained by taking a median split of subjects on the basis of the total number of dreams they reported. The test of association was highly significant ($\chi^2_{1} = 39.17$, $p < .001$), and did not vary across groups. In addition, ANOVA with repeated measures was performed for each dependent variable, to assess changes in mean scores as a function of time measured in weeks.

Waking to Dreaming Transfer Effects:

1. Dream Self-reflectiveness (DSR). There was a significant main effect of treatment on dream DSR scores ($F_{2,82} = 5.83$,

Table 4.6. Means (and standard deviations)
for dependent measures.

		GROUP		
		Baseline (n=32)	Attention (n=30)	Schema (n=32)
DSR	Hi male	4.82 (0.54)	4.83 (0.51)	5.02 (0.84)
	Lo male	4.24 (0.55)	4.84 (0.78)	5.40 (1.55)
	Hi female	4.91 (0.91)	5.24 (0.45)	5.98 (0.66)
	Lo female	4.31 (0.63)	5.42 (0.91)	5.42 (1.42)
	Group	4.61 (0.71)	5.08 (0.68)	5.48 (1.11)
DC	Hi male	5.22 (0.65)	4.94 (0.32)	4.92 (0.58)
	Lo male	4.48 (0.72)	4.71 (0.74)	5.37 (1.25)
	Hi female	4.90 (0.41)	5.00 (0.22)	5.67 (0.57)
	Lo female	4.61 (0.45)	4.80 (0.29)	4.81 (0.65)
	Group	4.83 (0.62)	4.88 (0.40)	5.23 (0.83)
No. of Dreams	Hi male	16.56 (6.77)	14.44 (6.95)	19.22 (14.18)
	Lo male	9.38 (6.46)	5.50 (2.88)	6.36 (2.67)
	Hi female	16.89 (4.46)	15.75 (3.06)	16.20 (5.16)
	Lo female	9.67 (2.16)	8.00 (4.83)	8.33 (6.19)
	Group	12.56 (6.35)	11.50 (6.32)	13.53 (9.70)
Words	Hi male	110 (50)	132 (35)	139 (81)
	Lo male	95 (52)	131 (58)	138 (86)
	Hi female	126 (46)	155 (36)	130 (34)
	Lo female	64 (21)	132 (48)	156 (38)
	Group	102 (48)	138 (42)	139 (62)

Note: DSR: Dream Self-reflectiveness scale score
DC: Dream Control scale score

$p=.001$). The Student-Neuman-Keuls test of mean differences shows that both Attention Control and Schema groups had significantly higher scores than did the Baseline group, suggesting that both treatments serve to increase dream self-reflectiveness. In addition, there was a significant main effect for sex ($F_{1,82}=5.04$, $p=.028$), with females having higher overall scores on the dream self-reflectiveness measure than males.

It should be noted that this same analysis performed on subject means which are calculated exclusive of lucid dreams, yields the same results: significant main effects for treatment ($F_{2,82}=5.12$, $p=.005$) and gender ($F_{1,82}=7.30$, $p=.008$), with Schema and Attention Control subjects having significantly higher DSR means than Baseline subjects, and females having significantly higher DSR means than males.

The hypothesized treatment by recall frequency interaction in DSR scores did not reach significance ($F_{2,82}=2.037$, $p=.246$), nor did the main effect for recall frequency ($F_{1,82}=1.155$, $p=.286$). As can be seen from Figure 4.3, high and low recallers are significantly different in the distributions of their dreams across DSR scale categories ($\chi^2=18.69$, $p=.017$). It should be remembered that while such distributions describe information lost in subject means, assumptions of independence are violated.

When the recall frequency variable is based not on self-report prior to the experiment, but rather on the

actual recall frequency subjects demonstrate during the experiment, there is greater support for the hypothesized relation between recall frequency and dream self-reflectiveness. A median split of subjects within each group was performed and used as an independent measure with treatment and gender in a 3x2x2 ANOVA. In this post-hoc analysis, treatment effects were significant, a gender difference approached significance, and high recallers had higher DSR scores than low recallers ($F_{1,82} = 5.069, p = .027$), as predicted. However, the expected interaction between observed recall frequency and treatment did not reach significance ($F_{1,82} = 2.065, p = .133$). The DSR means are:

	Baseline	Attention	Schema
High (Observed)	4.86	5.09	5.19
Low (Observed)	4.32	5.07	5.06

T-tests were performed to assess the hypothesis that the Baseline difference in dream self-reflectiveness between high and low recallers is attenuated in the Schema condition. High recallers in the Baseline group had significantly higher DSR scores than low recallers ($t_{30} = 2.53, p = .017$), while this difference was not significant in the Schema group.

ANOVA with weekly DSR scores used as a repeated measure shows a significant interaction between treatment and the

Figure 4.3. Distributions of dreams (%) across Dream Self-reflectiveness scale categories in high and low frequency dream recallers (n=1212).

Figure 4.4. Weekly means on Dream Self-reflectiveness scores for each group (n=76).

repeated DSR measure ($F_{4,128} = 4.28, p = .003$) which is depicted in figure 4.4. It can be seen that Attention Control subjects performed like Schema subjects during the first week, but dropped to levels more comparable to Baseline subjects during weeks two and three. Tests of simple main effects demonstrate that there are significant differences between groups for each week of the experiment. After the first week ($F_{2,87} = 9.800, p < .001$), both Schema and Attention-control groups had higher DSR means than the Baseline group (Student-Neuman-Keuls). Week two dreams ($F_{2,82} = 7.771, p = .011$) were significantly more self-reflective in the Schema group than in other groups, and the same pattern was significant for week three dreams ($F_{2,82} = 9.931, p < .001$).

Table 4.7 presents correlations of pre-test variables with subject means on DSR scale scores. It can be seen that the correlation of Dream-ability with dream DSR is low to moderate in Baseline subjects, and that no pre-test variables co-vary significantly with dream DSR in treatment subjects overall. Correlations in the Baseline group are the more representative, since treatments modify the extant relationships between variables. These differences suggest that educating attention to dream self-reflectiveness largely overrides the effects of the individual differences operative in a Baseline condition.

Summary of DSR results: 1) The results support Hypothesis 1A, that increased waking attention to dreaming

increases dream self-reflectiveness. This was true for both treatments requiring attentional increases, since both had higher DSR means than did the Baseline group. The Schema group mean was higher than the Attention Control group mean as predicted, but not significantly so. 2) The prediction in Hypothesis 2A that high recallers would have higher DSR means than low recallers was partially supported. The effect was not significant for self-reported recall frequency prior to the experiment. Rather, categories of recall frequency observed during the experiment were significant determinants of DSR response. This finding is consistent with the fact that treatment effects account for more variation in scores than do individual differences. 3) A similar finding regarding pre-test trait and habit measures shows that these are modestly predictive of Baseline DSR and not predictive of treatment DSR, wherein current response to treatment largely overrides pre-experimental state. 4) Contrary to the expectation of Hypothesis 3, a significant gender effect on DSR scores did occur. Females had higher means than did males. 5) There was support for Hypothesis 4 that significant Baseline differences in high and low frequency recallers on DSR scores, were non-significant under Schema conditions. This again suggests the power of educating attention to override individual differences in performance. 6) Group DSR scores differed from each other over time. The effect of the first training sessions resulted in higher

Table 4.7. Correlations of pre-test variables with mean Dream Self-reflectiveness scale scores (two-tailed test).

Pre-test variables	Dream Self-reflectiveness		
	Baseline (n=32)	Attention (n=30)	Schema (n=32)
Dream Ability (C)	r=.429 p=.014	----	----
Attention to dreaming (C)	----	----	----
Lucid tendency (C)	----	----	----
Private Self-Conscious- ness Scale	----	----	----
Group Embedded Figures Test	----	----	----
Dreaming to Waking transfer tendency	----	----	----

(C): Composite variable devised from Initial Questionnaire items.

scores for treatment groups over the Baseline group. By week two, the Schema group mean was higher than those for Baseline and Attention Control groups, and this pattern held for week three.

2. Lucid Dreaming (LD). The comparison of spontaneous rates of lucid dreaming with experimentally induced rates is a specific aspect of dream self-reflectiveness targeted in this experiment. Chi Square analysis of the number of lucid and non-lucid subjects across groups shows a significant group difference ($\chi^2 = 17.17$, $p < .001$), which is clearly attributable to the 50% of Schema subjects who reported one or more lucid dreams. It can be seen from Table 4.7 that the spontaneous incidence of lucid dreams in Baseline and Attention Control subjects is about 1%, which is the rate commonly observed (McCarley and Hoffman, 1981; Purcell et al., 1986). The rate of 13.13% observed in the Schema group is substantially above spontaneous rates (Table 4.7).

A test of association between the presence or absence of lucidity, and the experimentally observed dichotomy of high and low recall rates, yields a significant Chi Square (4.57, d.f. 1, $p = .033$). Those subjects in the Schema group who achieved lucidity tended to be those with highest rates of recall during the experimental period. Those who were experiencing good rates of recall prior to the experiment did not show a significant tendency to develop lucidity

Table 4.8 Rates of lucid dreaming under different treatment conditions.

	Baseline (n=32) dreams=433	Attention-Control (n=30) dreams=345	Schema (n=32) dreams=434
No. lucid subjects	4 (12.5%)	3 (10.0%)	16 (50%)
No. lucid dreams	7 (1.62%)	3 (0.90%)	57 (13.13%)

during the experiment.

Table 4.9 shows the relation of pre-test variables with the number of lucid dreams for each subject. In Baseline and Attention Control groups there were few lucid dreamers. In the Schema group, where half the subjects submitted at least one lucid dream, the composite variable 'Lucid tendency' was the only significant predictor of who would respond to lucid dream induction during the experiment ($r=.45$). As discussed above, the main correlate of lucidity was the rate of dream recall during the experimental period.

Summary of results on lucid dreaming: 1) Hypothesis 1A11 was strongly supported in that there was a good response to LD induction in the Schema group. 2) Subjects who reported at least one lucid dream during the

Table 4.9. Correlations of pre-test variables with number of lucid dreams per subject.

Pre-test variables	Number of Lucid Dreams		
	Baseline (n=32)	Attention (n=30)	Schema (n=32)
Dream Ability (C)	----	----	----
Attention to dreaming (C)	----	----	----
Lucid tendency (C)	----	----	r=.454 p=.009
Private Self-Conscious- ness Scale	----	----	----
Group Embedded Figures Test	----	----	----
Dreaming to Waking transfer- tendency	----	----	----

(C): Composite variable devised from Initial Questionnaire items.

experimental period tended to be those with good rates of recall during the experiment. 3) Pre-experimental self-reported experience with pre-lucid and lucid phenomena was the the only other correlate of LD response. 4) As reported in the section on scale properties, lucid subjects showed significantly more non-lucid dream self-reflectiveness and dream control than subjects who did not report lucid dreams during the experiment. 5) Lucid subjects showed greater dreaming to waking transfer effects than other subjects, which will be discussed later with other post-test findings.

3. Dream Control (DC). Dream control was taught to only one group in only one treatment session, so that effects are significant but small. The treatment difference was significant as a main effect ($F_{2,82} = 3.84, p = .026$). The Student-Neuman-Keuls test of mean differences shows that Schema subjects (mean = 5.23) had significantly more dream control in their reports than did either Baseline (mean = 4.83) or Attention Control subjects (mean = 4.88), consistent with the fact that dream control was taught only to Schema subjects. There was a significant main effect for self-reported frequency of dream recall, with high recallers (mean = 5.12) demonstrating more dream control than low recallers (mean = 4.79), ($F_{1,82} = 6.07, p = .016$). Figure 4.6 shows the distributions of all dreams across DC scale categories for high and low recallers. These distributions are significantly different (Chi Sq = 20.048, $p = .010$).

Figure 4.5. Interaction of group, sex and dream recall frequency on mean Dream Control scores ($n=94$).

Figure 4.6. Distributions of dreams (%) across Dream Control scale categories in high and low frequency dream recallers ($n=1212$).

There was a significant 3-way interaction between treatment, gender and recall frequency for Dream Control Scale scores ($F_{2,82} = 4.29, p = .017$), depicted in Figure 4.5. Female high recallers and male low recallers were most responsive to dream control instruction, whereas male high recallers and female low recallers did not differ from subjects in conditions with no dream control instruction. Figure 4.5 shows that greatest variation occurred in the Schema group. A test of simple main effects performed on the means for high and low males and high and low females was not significant, nor was any mean significantly different from another. When recall frequency observed in the experiment was used as the independent measure in the overall factorial ANOVA, rather than the pre-experimental self-report measure, there were significant main effects for treatment ($F_{2,82} = 5.699, p = .005$) and observed recall frequency ($F_{1,82} = 5.968, p = .017$), and no significant interactions or main effects involving gender. The means for observed high and low recallers (5.15 and 4.81 respectively) were very close to those for self-reported high and low frequency recallers (5.12 and 4.79 respectively).

When DC score means excluded the lucid control category (DC=9), the ANOVA using treatment, gender and self-reported recall frequency showed a main effect for recall frequency ($F_{1,82} = 5.519, p = .021$), but the treatment effect is no longer significant. This shows that the dream control treatment

effect was limited to lucid subjects' use of lucidity to exercise dream control, while non-lucid control was not significantly affected in the group as a whole.

T-tests were performed on high and low recallers in both Baseline and Schema groups in order to evaluate the hypothesis, that the high/low difference significant in the Baseline group would not be significant in the Schema group. A significant Baseline difference in DC between high (mean 5.059) and low (mean 4.535) recallers was found ($t = 2.57$, $p = .016$), and these differences did not exist in the Schema group (means: high, 5.316; low, 5.109).

Analysis of variance in dream control scores using weekly means as a repeated measure shows a significant effect of time on dream control as a main effect ($F = 7.40$, $p < .001$), that is, dream control means show an overall linear increase across weeks for all subjects. T-tests comparing these means show that the overall week three mean is significantly greater than the week two mean ($T = 2.27$, $p = .026$) and also greater than the week one mean ($T = 3.70$, $p < .001$).

The two-way interaction of treatment with the repeated measure (weekly DC means) was also significant ($F = 2.55$, $p = .043$) at both weeks two ($F = 4.076$, $p = .021$) and three ($F = 8.139$, $p < .001$). Schema subjects demonstrated significantly more dream control than either Baseline or Attention Control subjects on both weeks. Figures 4.7a and

Figure 4.7.a. Weekly means on Dream Control scores for
HIGH recallers in each group (n=52).

Figure 4.7.b. Weekly means on Dream Control scores for
LOW recallers in each group (n=24).

4.7b show that the biggest dream control increase in Schema subjects was after week two, when dream control instruction took place.

There was a significant three-way interaction of treatment with the repeated DC measure ($F_{4,128} = 3.20, p = .015$) which is different for high and low recallers (Figures 4.7a and 4.7b). In the Baseline group, high/low differences in dream control do not reach significance until week 3 ($F_{1,27} = 7.38, p = .011$). In the Attention Control condition, high frequency recallers have higher scores than low recallers at week one ($F_{1,27} = 11.35, p = .002$); at week two there is no difference, and by week three low recallers have significantly greater dream control than high recallers ($F_{1,24} = 6.78, p = .016$). Significant high/low differences are not observed in the Schema group at any time.

Table 4.10 reports the correlations of pre-test variables with dream control scores. 'Dream ability' and 'attention to dreaming' were modestly predictive of the spontaneous levels of dream control shown by the Baseline group. No variables were predictive of dream control in the Attention Control condition. In the Schema condition, 'Lucid tendency' was moderately correlated with Dream Control scores, pointing to the fact that high levels of dream control are associated with lucid dreaming.

Summary of Dream control results: 1) As discussed in the section on scale properties, lucid subjects had higher

Table 4.10. Correlations of pre-test variables with mean Dream Control scale scores (two-tailed test).

Pre-test variables	Dream Control		
	Baseline (n=32)	Attention (n=30)	Schema (n=32)
Dream Ability (C)	r=.394 p=.026	----	----
Attention to dreaming (C)	r=.370 p=.037	----	----
Lucid tendency (C)	----	----	r=.414 p=.018
Private Self-Conscious- ness Scale	----	----	----
Group Embedded Figures Test	----	----	----
Dreaming to Waking transfer tendency	----	----	----

(C): Composite variable devised from Initial Questionnaire items.

means on non-lucid control than did non-lucid subjects. 2) There was an increase in dream control over time for subjects overall. 3) High and low frequency recallers performed differently over time in each group. High recallers had higher DC scores than low recallers overall, although significant high/low differences in the Baseline condition were not significant in the Schema condition as predicted in Hypothesis 4B. 4) Schema subjects who were taught dream control did achieve higher DC levels than did subjects in other groups, a pattern of convergence predicted in Hypothesis 1B. 5) A significant treatment by gender by recall frequency interaction was found, although males were not consistently highest in dream control as predicted in Hypothesis 3. In the Baseline group they outperformed females, but in the Schema group, female high recallers demonstrated highest DC levels. This complex interaction with gender is non-significant when subjects are designated high or low recallers on the basis of observed recall rates. 6) As with dream self-reflectiveness, individual differences at pre-test account for less variation in dream control scores than do treatment manipulations of attention.

Dreaming to Waking Transfer Effects:

1. Rate of Dream Recall. A 3x2x2 factorial ANOVA was performed on observed frequencies of dream recall during the experiment. As expected, the only significant effect was the

main effect for the self reported trait of recall frequency ($F_{1,82} = 38.204$, $p < .001$). However, this accounted for only 30.6% of the variance in observed dream recall frequency, demonstrating that subjects' habits of recall are variable and are altered by an experiment, even in a Baseline condition. Table 4.6 shows that observed rates of dream recall are consistent with self-report in high recallers (5 times a week or more), and greater than expected in low recallers. The average low recaller reported 2.67 dreams per week compared with a pre-experimental rate of once a week or less. Low recallers therefore reached rates of reporting consistent with average or mid-range recallers (Wells et. al., 1978). Repeated measures ANOVA using observed recall rates as the dependent measure, demonstrates significantly greater production during the first enthusiastic week of the experiment for all subjects, but particularly in high recallers ($F_{2,164} = 3.39$, $p = .036$), although low recallers maintain mid-recaller rates and high recallers maintain high rates.

Table 4.11 shows the relationships between pre-test variables and the dependent measure of recall rate. Unlike the other dependent measures for which treatments reduced or eliminated the co-variation with pre-test variables, the profiles for recall rate are relatively similar for all groups. 'Dream-ability' and 'Attention to dreaming' were moderately correlated with recall rate in all groups. The

Table 4.11. Correlations of pre-test variables with number of dreams per subject (two-tailed test).

Pre-test variables	Number of Dreams		
	Baseline (n=32)	Attention (n=30)	Schema (n=32)
Dream Ability (C)	r=.430 p=.014	r=.557 p=.001	r=.402 p=.022
Attention to dreaming (C)	r=.552 p=.001	r=.631 p=.000	r=.412 p=.019
Lucid tendency (C)	----	r=.393 p=.032	----
Private Self-Conscious- ness Scale	----	----	r=.381 p=.031
Group Embedded Figures Test	----	----	----
Dreaming to Waking transfer tendency	r=.407 p=.021	r=.426 p=.019	----

(C): Composite variable devised from Initial Questionnaire items.

pre-experimental experience of dreaming-to-waking transfer effects covaries with recall rate in Baseline and Control groups, but not in the Schema group. Private Self-consciousness scores are correlated ($r=.38$) with recall rate in the Schema group only. The Group Embedded Figures Test is unrelated to observed recall rates.

As stated previously, observed recall frequency covaries more strongly with the dependent measures than does self-reported recall frequency. As will be discussed, this pattern holds for dreaming-to-waking transfer effects (post-test).

2. Word Count. Groups differed significantly in the length of their reports ($F_{1,82} = 5.053, p=.009$). The Student-Neuman-Keuls test of mean differences shows that Schema and Attention Control subjects have longer dream reports than do Baseline subjects as shown in Table 4.6. Repeated measures analysis shows a small but significant decline in word counts after the first week for subjects overall ($F_{2,128} = 3.30, p=.040$). These results replicate those in Purcell et. al. (1986). There was no significant effect for self-reported recall frequency. However, the post-hoc use of observed recall frequency in this analysis did reveal a significant effect for recall frequency on word count ($F_{1,82} = 5.418, p=.022$). Average length for observed high recallers was 138.5 words, and for observed low recallers, 114.1 words.

Table 4.12. Correlations of pre-test variables with mean word count.

Pre-test variables	Word Count		
	Baseline (n=32)	Attention (n=30)	Schema (n=32)
Dream Ability (C)	r=.500 p=.004	----	----
Attention to dreaming (C)	r=.382 p=.031	----	----
Lucid tendency (C)	----	----	----
Private Self-Conscious- ness Scale	r=.353 p=.047	----	----
Group Embedded Figures Test	----	----	----
Dreaming to Waking transfer tendency	----	----	----

(C): Composite variable devised from Initial Questionnaire items.

Table 4.12 presents the associations between pre-test variables and word counts. As with most other dependent measures, predictors are mainly associated with Baseline results, since treatments appear to equalize subject differences.

3. Post-test: Dreaming to Waking Transfer Effects. Table 4.13 gives the ten dreaming to waking transfer effects in abbreviated form. Analysis of variance was performed on these items using treatment, gender and self-reported recall frequency as independent variables. Contrary to expectation, no group effects were evident for any item; significant effects were always due to self-reported recall frequency when they occurred. When observed recall frequency was used as an independent variable the differential effects noted by high and low frequency recallers were even stronger. Table 4.14 details these effects. Seven out of 10 items show significant differential effects of recall frequency.

Table 4.13 presents the significant effects of ANOVA using gender and self-reported recall frequency as independent variables within each group, with the addition of lucidity/non-lucidity in the Schema group. Those subjects who responded to lucid dream induction, which was clearly an effect of treatment, did experience greater dreaming-to-waking transfer effects than their non-lucid counterparts in the same condition. This fact indicates that even though

Table 4.13. Post-test of dreaming to waking transfer effects:
Items t1 to t10 (n=94).

Item	Baseline	Attention	Schema
t1: effect of recording dreams on waking life: none...alot		gender** $\bar{X}(M)=2.73$ $\bar{X}(F)=3.67$	lucidity by high/low by gender** (Subtable 4.12.a.) high/low* $\bar{X}(\text{high})=4.05$ $\bar{X}(\text{low})=2.85$
t2: dreams have become more interesting to me: false...true			lucidity*** $\bar{X}(L)=5.81$ $\bar{X}(NL)=4.06$
t3: awakening more often in 'moods' during experiment: false...true		high/low** $\bar{X}(\text{high})=3.65$ $\bar{X}(\text{low})=2.38$	
t4: awakening with ideas and solutions: never...frequently			
t5: dream recall frequency compared to usual: less...more	high/low*** $\bar{X}(\text{high})=3.61$ $\bar{X}(\text{low})=5.43$		lucidity* $\bar{X}(L)=4.56$ $\bar{X}(NL)=3.56$
t6: awakening with an urge to action: never...frequently	high/low** $\bar{X}(\text{high})=3.39$ $\bar{X}(\text{low})=2.29$		

Table 4.13 continued

t7: rehearsal of dream action later performed in waking: never...fre- quently												
t8: dream producing greater clarity on a waking issue: never...fre- quently												
t9: dream producing waking confusion on an issue : never...fre- quently		high/low by gender** <table><tr><td></td><td>High</td><td>Low</td></tr><tr><td>M</td><td>4.22</td><td>1.63</td></tr><tr><td>F</td><td>4.50</td><td>4.43</td></tr></table> high/low** X(high)=4.35 X(low)=3.23 gender** X(M)=3.27 X(F)=4.47		High	Low	M	4.22	1.63	F	4.50	4.43	lucidity*** X(L)=2.50 X(NL)=4.44
	High	Low										
M	4.22	1.63										
F	4.50	4.43										

Table 4.13 continued

t10: writing dream reports increasing understanding of a waking issue: never...fre- quently	high/low*	lucidity by high/low*	
	$\bar{x}(\text{high})=4.67$		
	$\bar{x}(\text{low})=3.36$		
		High	Low
		L 5.09	3.80
		NL 3.00	3.63
		lucidity**	
		$\bar{x}(L)=4.69$	
		$\bar{x}(NL)=3.31$	

*** p < .01

** p < .05

* p < .10

Notes: high/low: high frequency dream recallers; low frequency dream recallers

M, F: male, female

L, NL: lucid, non-lucid subjects

... represents 7-point scale

Items are in abbreviated form, and refer to the experimental period only (Appendix F describes the items in more detail).

Subtable 4.12.a. Means for lucid and nonlucid male and female high and low recallers on item t1 of post-test.

		High	Low
L	M	5.00	2.00
	F	4.25	3.50
NL	M	2.83	3.75
	F	5.50	2.25

Table 4.14. Comparison of self-reported and observed high and low frequency recallers on dreaming to waking transfer effects (n=94).

	Self-report	Observed		Self-report	Observed
t1	hi/lo** $\bar{X}(hi)=3.69$ $\bar{X}(lo)=2.88$	hi/lo*** $\bar{X}(hi)=3.91$ $\bar{X}(lo)=2.77$	t6	overall $\bar{X}=3.13$	
t2	overall $\bar{X}=4.97$	hi/lo** $\bar{X}(hi)=5.36$ $\bar{X}(lo)=4.57$	t7	overall $\bar{X}=2.69$	
t3	hi/lo** $\bar{X}(hi)=3.69$ $\bar{X}(lo)=2.85$	hi/lo* $\bar{X}(hi)=3.74$ $\bar{X}(lo)=2.91$	t8	hi/lo* $\bar{X}(hi)=4.24$ $\bar{X}(lo)=3.52$ gender* $\bar{X}(M)=3.56$ $\bar{X}(F)=4.33$	hi/lo*** $\bar{X}(hi)=4.49$ $\bar{X}(lo)=3.38$
t4	hi/lo** $\bar{X}(hi)=3.50$ $\bar{X}(lo)=2.65$	hi/lo** $\bar{X}(hi)=3.51$ $\bar{X}(lo)=2.77$	t9	overall $\bar{X}=3.71$	
t5	overall $\bar{X}=4.23$		t10	hi/lo* $\bar{X}(hi)=4.43$ $\bar{X}(lo)=3.63$	hi/lo*** $\bar{X}(hi)=4.70$ $\bar{X}(lo)=3.47$

*** p < .01

** p < .05

* p < .10

Notes: hi/lo: high frequency dream recallers; low frequency dream recallers

L, NL: lucid, non-lucid subjects

Table 4.12 contains a brief description of the ten dreaming to waking transfer items.

the lucidity variable cannot be used in an overall ANOVA for all groups, there actually were greater dreaming to waking transfer effects in lucid subjects, as a result of treatment. These effects were in regard to 4 of 10 items: t1 - more effect of recording dreams upon waking life; t2 - greater awareness of dreams as having become more interesting than prior to the experiment; t9 - non-lucid subjects experience greater confusion on an issue after waking from a dream about it; t10 - lucid subjects experience greater understanding of waking issues as a result of writing out their dream reports.

A score of 1 on these items represents no effect at all. The average item score was 3.65, suggesting measurable dreaming-to-waking transfer effects that could be increased in experiments designed to do so. Effects in the present experiment are due to attention to dreaming, since subjects were not trained beyond dream report writing to have these effects. The practice effect is more evident in those who recalled more dreams. Only one item, t7, shows no power to discriminate between subjects in this experiment, and has the lowest overall mean, 2.69. This item refers to the dream rehearsal of an action that improves the waking performance of such an action. It may be that this event is statistically rare, or that it needs more specific pre-sleep deployment of attention to a skill that is important in waking. The dream development of flying skill, for example,

is of little use in waking. Overall, the items show that modest dreaming-to-waking transfer effects do occur in all groups, and occur maximally in subjects who respond maximally to the experiment. This suggests that these effects could be increased experimentally.

Summary of Dreaming-to-waking transfer effects: 1) Observed rates of recall were generally consistent with pre-experimental self-report. High recallers performed as expected and low recallers performed better than expected. 2) Observed recall rates accounted for slightly more variation in the dependent measures than did pre-experimental self-reported rates. 3) Schema and Attention-control subjects had longer dream reports than did Baseline subjects, since detailed dream reporting was required of these two groups. 4) High recallers had longer reports than low recallers, but only when post-hoc observed criteria defined this variable. 5) As predicted in Hypothesis 2C recall frequency, especially observed recall frequency, was strongly associated with dreaming-to-waking transfer effects. 6) Subjects who responded successfully to lucidity training tended to have good experimental recall rates, and did report greater dreaming-to-waking transfer effects than did their non-lucid counterparts. 7) Good rates of dream recall in the experiment appeared to facilitate more transfer of information from dreaming to waking than did treatments.

Dream Phenomenology:

In several important ways, lucid dreams induced in the Schema condition tended to differ from spontaneous lucid dreams occurring in Baseline and Attention Control conditions.

Figure 4.2 shows the distribution of dreams in SR categories 7, 8 and 9 for the different groups. As was mentioned earlier, The boost to dream self-reflectiveness caused by increased attention to writing all dream detail, shows in the increase over Baseline in category 7 dreams, the category from which most of the contingencies for triggering lucidity are scored. (Category 8, non-lucid control, can also serve as a trigger). Schema subjects however, show fewer category 7 dreams and more category 9 (lucid) dreams, suggesting they have actually used category 7 dreams to trigger lucidity as was taught. Again, this result connects points of the scale with each other in a functional way, supporting its construct validity. Chi square analysis shows no tendency for high and low recallers in the Schema condition to be different in their representation in categories 7, 8 and 9.

Lucid dreams were examined for the presence or absence of rehearsed schemas, wherein lucidity was the contingent response, and comparisons were made of Baseline and Attention Control dreams with Schema dreams. Fisher's Exact test shows that the Schema dream reports contained

significantly more triggers than dreams from other groups which tended not to include triggers to lucidity ($p=.024$).

Successful triggers which did appear in spontaneous lucid dreams were: one example of recognizing a dream oddity, one flying dream, and one dream which was experienced as an out-of-body experience.

In the Schema group, subjects with multiple lucid dreams tended to use the same trigger nearly every time, and typically this was the recognition of a dream oddity. Twenty-four lucid episodes were triggered by the recognition of a dream oddity. Eleven lucid dreams contained references to the experiment, and on 4 of these occasions, this triggered the lucid episode. There were 4 lucid dreams triggered by the recognition of a recurring dream sequence, 3 were stress induced, and 2 were falling dreams. One dream became lucid when the dreamer arrived at a certain place in which he had arranged with a friend in the waking state, to meet in the dream state. Eighteen Schema lucid dreams had no trigger evident in the report.

Some evidence of dream control was also more common in Schema lucid dreams than in those from other groups, although this tendency did not reach statistical significance (Fisher's Exact $p=.154$). In addition, spontaneous lucid episodes from Baseline and Attention-control subjects tended to be prolonged rather than fleeting or brief as was the case with Schema subjects (Fisher's

Exact $p=.028$). This suggests that spontaneous lucidity arose in subjects who were experienced prior to the experiment, while the trained subjects were novices having the expected fleeting lucid experiences.

Summary of phenomenological aspects: Examination of the dream reports shows that Schema subjects did respond to their dream generated experience in ways that were taught to them during waking, compared to untutored subjects. They demonstrated the expected novice pattern of response to lucidity which is to be able to maintain the experience only briefly. They demonstrated the effects of having some training in dream control, responding to lucidity with some dream control effort in most cases.

The following chapter presents a discussion of these results and implications of the findings.

CHAPTER V

Discussion

Study 2 has essentially replicated and extended the findings of Study 1, and those of Study 2 in Purcell et. al. (1986). This chapter is designed to explicate how the results lead to the following briefly stated conclusions.

Base rate levels of dream self-reflectiveness including lucid dreaming, and of dream control, are now well established for psychology undergraduates. Similarly is the demonstration that these processes may be enhanced through waking entrainment of attention and intention on these processes. This influence on dreaming was shown in Study 2 to have certain effects on subsequent waking cognition/experience. Additionally it was shown that the differences between high and low frequency recallers can be largely conceived in terms of differences in habits of attention that do respond to reorganization. Finally, Studies 1 and 2 have reasonably demonstrated the validity and reliability of the psychometric tools developed and used to generate these findings.

Results

The results of Study 2 (and Study 1 where replication is a factor) are framed here in terms of transfer effects, either from waking to dreaming or from dreaming to subsequent waking. These effects are discussed in terms of

a) the instruments used to measure them, b) the treatments designed to influence them, and c) the individual differences which modify them. The implications of these findings for both specific theories and a general theory of dreaming will then be explored.

Scales. Results from Studies 1 and 2 show that Dream Self-reflectiveness and Dream Control can be reliably measured; that these scales adequately approximate the normally distributed continuous constructs which they represent; and that the results are comparable across different experiments. The Dream Control Scale is particularly satisfactory with regard to its psychometric properties. The Dream Self-reflectiveness scale, while satisfactory, could be improved by broadening the description of category 4. This could be done without distorting the theoretical framework underlying the scale.

Several results from Study 2 support the construct validity of lucidity on this DSR dimension. Lucid subjects had higher DSR means than non-lucid subjects, even when their lucid dreams were excluded. Also, the dream phenomenology from both studies shows that they clearly used the cues to trigger lucidity, cues which emerge in categories 7 and 8. In addition, the mechanism of attention to dream detail which comprised the Attention Control treatment, resulted in significantly more category 7 dreams (two levels of awareness) than occurred in the Baseline

group. More general empirical support for the scaled theoretical dimension comes from the fact that the scale results generally conform to theoretically derived expectations.

Similarly, lucid control as high level intentional dreaming on the Dream Control scale is supported by the fact that the non-lucid dreams of lucid subjects demonstrated significantly more control than the dreams of non-lucid subjects.

In studies 1 and 2, the distributions of dreams in the Baseline group across both scales show that self-reflection and intentional action occur naturally in the dream state, and that the degree to which noticing and action systems are operative, varies, as it does in waking. Spontaneous and uninfluenced dreaming demonstrates a range of self-reflectiveness from none to fully lucid awareness of state. Spontaneous dreaming also demonstrates a range of intentional functioning from none, to awareness of control over the generation of dream events. In the vast majority of spontaneous dreams the dreamer is moderately self-reflective and moderately effective in his actions.

In Study 2, the correlation across all dreams between DSR and DC scales is significant but low, .32 in the Baseline condition. This reflects the fact that the constructs of dream self-reflectiveness and dream control are largely independent. The covariation can be eliminated

by increasing reflective attention to dreaming as in the Attention Control condition. Here, the correlation between scales is .09. Conversely, the covariation between DSR and DC scales can be increased by increasing the interaction between noticing and behavioral systems as was the case in the Schema condition. Here the correlation was significant and moderate ($p=.57$). (This pattern of results is the same as found in Study 1, although the correlations were slightly higher when subjects were not selected for individual differences.) Self-reflective and intentional behaviors are apparently independent functions within the self-regulatory system. These results support the natural occurrence of self-regulatory functions in dream experience, two of which are self-reflective and intentional systems which are independent, but which are potentially co-dependent. At highest levels of these capacities, each may be maximized in the presence of the other. For example, non-lucid control can trigger lucidity; conversely, lucidity can facilitate greater control.

The post-test items querying dreaming-to-waking transfer effects appear to have preliminary merit. Subjects reported noticing each of these effects to varying degrees, and items typically discriminated between high and low frequency recallers. Greater recall during the experimental period was associated with increased notice of dreaming-to-waking transfer effects. Lucid dreamers noticed more such

effects than non-lucid dreamers. A focused but still general attention to dreaming such as writing dream reports, facilitates noticing these effects for all groups. The near lack of differential group effects suggests that attention to recalled dreams, common to all groups, is the main factor at work here. These effects can apparently be increased through successful lucidity training. Whether specifically targeted waking behaviors can be increased through training is open to investigation, but the present results regarding dream self-reflectiveness and control reveal dream processes to be potentially accessible, both from waking and within dreaming. The treatment effects regarding lucidity and lucid control are cause for optimism that specifically targeted dream skills can be learned, possibly to the benefit of waking clarity about life issues according to specific post-test results. The post-test findings demonstrate that the transfer of information occurs not only from waking to dreaming, but also from dreaming to subsequent waking.

Treatments. The simple writing out of dream reports without further instruction (Baseline condition), shows that dream self-reflectiveness and dream control are spontaneously reported at mid-range levels (4.61 and 4.62 respectively, on 9-point scales), with distribution approximating the normal. Between 1 and 2% of all reported dreams are lucid, and about 12% of subjects spontaneously

report them within a three-week period. High frequency recallers reported between 5 and 6 dreams a week as expected, but low recallers apparently recall more dreams than usual when asked to write them down, about 3 per week. The average dream under Baseline conditions was 102 words long. In Study 1, Baseline subjects were lower on all these dimensions except for rate of recall. This is thought to be due to the lack of random assignment in this group, and to the fact that they had no experimenter contact at all for three weeks.

The findings from the Attention Control group show that relative to a Baseline condition, increased attention to dream detail affects important aspects of dream reports. Dreams become longer and more self-reflective, thus supporting the idea that the mechanism which drives naturally occurring dream self-reflectiveness is simply, detailed attentiveness to dreaming. Detailed reporting is a self-reflective waking behavior which results in higher mean self-reflectiveness scores. Two interpretations of this finding, which are not necessarily exclusive of each other, are possible. One is that subjects notice more about their dreams this way, which shows for example, in the significant increase over Baseline rates of category 7 dreams (two levels of awareness on the DSR scale). The alternative interpretation is that actual dreaming becomes altered by the increased attention deployed to it during dreaming, and

that this enhanced within-dream attention is itself a response entrained by the increased waking attention to dreaming. This interpretation is consistent with Rossi's theoretical view and points to the transfer of habits of attention from waking to dreaming. It is also consistent with certain clinical treatment methods (e.g. Gendlin, 1978) and meditative traditions (e.g. Goldstein, 1976) which utilize the reorganizing capacity of instructed attention.

Highest DSR scores in the Attention Control group occurred after the first week of dream collection. After weeks two and three, scores were not significantly higher than those of Baseline subjects. This suggests some loss of motivation since Attention Controls were never taught new skills; they were essentially asked to maintain detailed reporting. This result parallels the small but significant decline over time in the number of dreams reported across groups.

Schema group dreams were longer and more self-reflective than Baseline dreams, and additionally demonstrated significant increments in lucid dreaming and dream control over other groups. Repeated measures analysis revealed that a practice effect for dream control occurred not only for Schema subjects, but for low recallers in the Attention Control group as well. Schema subjects who reported lucidity during the experiment also had higher levels of self-reflectiveness and control in their non-lucid

reports than did subjects who reported no lucid dreams.

While measureable dreaming-to-waking transfer effects occurred for subjects in general due to the exercise of keeping a 3-week dream diary, significant treatment effects were demonstrated for the 50% of Schema subjects who responded successfully to lucidity training during the experimental period. These subjects showed greater effects than other subjects on several post-test items regarding waking insight. It is not yet clear whether the lucid experience itself contributed to extra waking insight, or whether the more insightful subjects were the ones who responded to lucidity training. The Private Self-consciousness scale does not shed light on the issue, since this instrument is generally disappointing as a predictor of self-reflective performance in dreaming, and even sometimes in waking (Kuiken, 1981). Rossi's theory of self-reflection would predict that both mechanisms are operative in affecting subsequent waking due to the two-way feedback that self-reflectiveness generates across both dreaming and waking awareness. Future research could ascertain whether subjects are even more successful in learning specifically targeted and rehearsed dream behaviors such as is the present case with dream self-reflection and dream control. The goal would be a dreaming-to-waking transfer effect which improved a waking skill. For example, athletic skills now practised in vitro may be easier to perfect during the more

vivid imagery of dreaming. The ideal in vitro situation is likely lucidity with its facilitation of dream control.

The Attention Control results for dream self-reflectiveness and control suggest that detailed attention to dreaming may feed back on subsequent dreaming. The Schema results show that specific self-reflective and intentional behaviors can be targeted, rehearsed and learned, thereby further increasing mean performance on these dimensions. Lucid subjects show that successful lucidity induction is linked to previous lucid and pre-lucid experience, with higher rates of dream recall during the experimental period, and with higher levels of non-lucid self-reflectiveness and control in their dreams. These results are supportive of Rossi's interactive feedback conception of self-reflectiveness.

Pre-test measures of subject traits and habits regarding dreaming were modestly predictive of performance in the Baseline condition. Self-reported 'dream ability' and 'attention to dreaming' covaried with self-reflectiveness and dream control in Baseline dreams. In addition to these two predictors, Private Self-consciousness scores were somewhat predictive of word counts. However, these individual differences bore no statistical relation to performance in treatment groups, where the focusing of attention on dreaming in general (Attention Control condition) and on specific aspects

(Schema condition) acted as an equalizer of subject differences. An exception to this trend in the findings was with regard to rates of dream recall during the experimental period. There were no significant group differences as treatments did not increase dream recall rates beyond those in the Baseline condition. However, in this respect, the requirement to recall and report all dreams which existed for all groups, had a noticeable effect on low recallers. They performed like mid-range recallers in all groups. Again, the deployment of attention on dreaming tends to override the effects of individual differences. The results of the treatments show that the dream self-regulatory functions of self-reflectiveness and intentional behavior occur naturally, and that they are increased through learning and practice. This learning process occurs through common access to information from both waking and dreaming states, mediated by attention. When dream self-regulation becomes fully meta-cognitive, subjects experience more noticeable effects of it on both dreaming (through increased intentional self-expression) and on subsequent waking (through increased grasp of waking life issues).

Dream Recall Frequency. High and low frequency recallers both performed differently on evaluative pre-test measures, and described themselves differently on self-report pre-test measures. On experimental dependent measures, heightened performance was associated with a pre-

test self-report index of dream recall frequency, but more with actual recall frequency reported during the experimental period. Since dream recall rates vary somewhat within individuals, those subjects who recalled more dreams during the experiment are seen as having more material to work with in learning the complex tasks required by the experiment, particularly the Schema condition.

From this perspective, significant results on repeated measures analyses are important because they are based on subjects who recalled dreams for each week of the experiment. For Baseline subjects, the high/low differential in dream control becomes significant only at week three, which is easily interpreted as a practice effect that occurs only for high recallers in a short time frame and without instruction. In the Attention Control condition, detailed reporting produced a significant high/low difference at week one which disappeared at week two. Apparently this treatment produced a powerful practice effect in low recallers who are typically less inclined to attend this much to dreaming because by week three low recallers showed significantly greater dream control than high recallers. It may be that the detailed writing out of dream reports remained motivating for low recallers, for whom the exercise was more novel and who maintained more stable recall rates across weeks. If this occurred then this was the ideal context in which these subjects could develop a spontaneous and

uninstructed increase in dream control. In the Schema condition there were no significant high/low differences at any point, suggesting that the learning tools given these subjects were powerful enough to override high/low differences and that both types of subjects were able to use them. This result was expected on exactly these grounds and also held true for dream self-reflectiveness. High/low differences that were significant at Baseline lost significance under Schema conditions.

On the Group Embedded Figures Test, which purports to measure an individual's level of psychological differentiation (Witkin et.al., 1971, p.8), high recallers had higher scores than low recallers to an extent that only approached statistical significance, but this result falls short of the expectations based on previous research. It has become clearer that field dependence/independence is far from a unitary construct (Missler, 1986) and that its relation to recall frequency is clearly more obscure than simply a global index of psychological differentiation which modestly discriminates high and low recallers. There may be waking/dreaming continuity in whatever the Group Embedded Figures Test measures, most conservatively evaluated as visual disembedding. Low scorers tend to organize fields along the simplest possible lines (Missler, 1986), as would be predicted by a differentiation hypothesis. However, the differentiations required by the experiment are not simply

visual but are often multi-modal and more abstract. The processes of self-reflectiveness require contextual disembedding of a highly abstract and complex nature. This context is situational and experiential. The cues to effect the differentiation may be pictorial, semantic, affective, sensorial, logical, logically disjunctive, or any combination of these. Using the State-shift model (Koukkou and Lehmann, 1983), the experience of such differentiation evokes an orienting response which may be called insight at this level of meta-cognitive abstraction. Dream self-reflectiveness is a far more abstract and general index of psychological differentiation than is capable of being indexed by the more concrete and discrete visual disembedding task. Although the latter is no doubt an aspect of psychological differentiation, it is too small a part to index a more global and top down meta-cognitive process.

Fenigstein et. al's (1975) Private Self-consciousness Scale, a self-report rather than performance measure, rates high recallers as more self-conscious during waking than low recallers. This finding parallels mean differences between high and low recallers in dream control, and to a lesser extent in dream self-reflectiveness. (An anticipated risk was that the pre-test administration of the Group Embedded Figures Test and of the three Self-consciousness subscales, in addition to the Initial Questionnaire, would actually cue sufficient attention to self-reflective and performance

issues in the Baseline group to eliminate a possible high/low difference as a main effect. This may actually have occurred.) However, the waking self-consciousness differential between high and low recallers more closely parallels post-test self-reports of dreaming-to-waking transfer effects, where high recallers consistently outscore low recallers. One post-test item suggests the validity of these self-reports. Item t5 queries experimental rates of dream recall compared to usual rates, an item for which the experiment provides independent confirmation. Both high and low recallers had self-report scores that were consistent with the difference between their experimental performance and their pre-experimental self-report. The correlation of Private Self-consciousness with the total of post-test items was .64 ($p=.001$). Yet this measure did not covary significantly with any dependent measures except for a modest correlation with the number of dreams recalled. Taken together, these findings suggest that the variation in dependent measures is not fundamentally due to variations in pre-experimental habits of private self-consciousness, but rather to the changes in the deployment of attention demanded by the experiment. This effect does not override pre-test habits of dreaming-to-waking transfer effects since these were not targeted by the experiment for any attentional or intentional manipulation. The fact that the Private Self-consciousness subscale does not covary with

dream self-reflectiveness scores in the Baseline condition shows that it is not a sensitive predictor of dream self-reflectiveness. Private Self-consciousness is a subscale which shares some variation with another subscale, Public Self-consciousness ($r=.41$), a factor which may distance it somewhat from dream self-reflectiveness. It should also be noted that Fenigstein's items do not really index the degree of insight or abstraction achieved in an individual's self-ruminations. An instrument with more predictive validity for dream self-reflectiveness would measure this dimension in a set of waking tasks. Mullington (in preparation) has proceeded in this way and found some specific relationships between waking and dreaming self-reflectiveness.

High frequency recallers report higher levels of overall dream competence at pre-test, suggesting the practice effect due to greater recalled dream experience as a life habit. This practice effect of dreaming-to-waking-to-subsequent-dreaming is an interpretation also consistent with the results due to treatments and the post-test findings. Higher scores on dependent measures were demonstrated by subjects who reported the most dreams during the experimental period, an effect that was even stronger than the one shown using pre-experimental self-reports of recall frequency. The differential in scores between highs and lows, which is significant at Baseline for dream control and for dream self-reflectiveness, becomes non-significant

in the Schema condition. The differential appears to be attenuated by the effects of attention and learning, which work as well for low recallers as for highs, and reduce the differences between them over a three week period.

Pre-test measures demonstrate the more positive attitude and greater interest high frequency recallers have in an aspect of life which is more figural for them than it is for low recallers. They additionally show a greater sensitivity to inner states and a greater openness to the influence of dreams on their waking lives. These attitudinal and attentional differences, which are consistent with the findings in the research literature, appear to be causal to a baseline difference in the measures of dream operativity used here. Conversely, when these same mechanisms of attention (and no doubt, of attitude) are exploited similarly in highs and lows, they respond similarly. Low recallers report at the rates of average recallers. Treatments, or variations in attentional and intentional manipulations account for more variation in dream control and dream self-reflectiveness than does the more distal personal history of recall frequency.

These results are in keeping with a control systems approach (Carver and Scheier, 1981), which can aid in the interpretation of high/low differences. From this perspective, cognizance of oneself as an individual and monitoring one's own behavior are necessary pre-conditions

to self-regulation. The same reasoning, that is, that self-attention promotes self-regulation, guides clinical approaches to personality change (e.g. Rossi, 1972). The present experiment reveals these same processes in dreaming and aspects of their relation to waking processes. From this view, self-regulatory processes which go on in both states, are related and are subsumed under the larger self-regulatory system which is the whole individual, not simply the waking individual.

A control systems approach is based on the function of feedback loops. Many such loops are negative, that is, their goal is discrepancy reduction and the return to a desired state. The positive feedback loop inferred by Rossi (1972) and from the present results, deals with discrepancy enlarging feedback. The process by which a discrepancy becomes noticeable (e.g. noticing bizarreness), makes a difference, or constitutes new information, is the process of differentiation or simply, of learning.

Carver and Sheier (1981) review studies in social psychology which show that increased self-focus facilitates self-regulation of behavior. From their scores on the Self-Consciousness scale and the Initial Questionnaire, high frequency dream recallers report greater self-focus than do low recallers. This may account for greater dream self-regulation (self-reflectiveness and control) in high recallers at Baseline. Interestingly, a trained re-

deployment of attention to their dreams (self-focus) in both high and low recallers begins to destabilize this difference as shown in the Attention Control condition.

Gender. As expected, gender effects are specific and occasional. One significant gender difference at pre-testing was on the Group Embedded Figures Test, a difference which replicates gender norms for this test. This greater ability males have for visual disembedding is not however, reflected in a gender difference in dream self-reflectiveness or successful response to lucidity training. In fact, females had slightly but significantly higher dream self-reflectiveness means than did males. These findings argue against the idea that dream recall is mediated by visual disembedding, or that dreaming is even primarily visual.

Female high recallers also had highest Private Self-consciousness scores of any subgroup, but female low recallers had the lowest. It appears that young college females tend to be more self-reflective than young college males, both in waking and dreaming, although low females are an exception during dreaming.

The slightly but significantly higher DSR mean demonstrated by females was not anticipated but neither is it overly surprising. One speculative interpretation involves Gilligan's (1982) explanation of gender differences

in prioritizing what principles meaningfully determine moral judgments and behavior. Females make more use of considerations of the network of relationships of which they are a part as the criteria for their behavior. This priority may put increased pressure on the necessity to reflect on one's behavior in an ongoing way which is slightly greater than the degree of self-reflection imposed by the more absolute principles which males tend to use as standards of conduct. In any case, this gender difference is small and is not paralleled by a similar gender difference in the degree of self-reflectiveness subjects perceive in themselves, that is, Private Self-consciousness scores. In view of its small magnitude, this result may alternatively be interpreted as an artifact of the greater anxiety in females according to their Anxiety Subscale scores.

The data-based expectation from Study 1 that males would demonstrate greater dream control than females was not borne out. At Baseline, differences in dream control were due to self-reported recall frequency in both sexes. Male high recallers had the highest scores in that group, but no subgroup involving gender and recall frequency was significantly different from another. Subgroups were not significantly different in other treatment conditions despite a significant three-way interaction involving treatment, gender and recall frequency. This interaction may not replicate with larger subsamples regarding gender as it

is a) almost uninterpretable (Figure 4.5), b) statistically weak since tests for simple main effects were not significant, nor were there any two-way interactions, and c) not congruent with other analyses involving dream control for which the variance due to gender is not a significant influence. For example, the slight difference in sample obtained by using observed recall frequency instead of self-reported recall frequency causes the gender effect to become non-significant, even though there is no clear outlier. In addition, the repeated measures analysis using the same independent variables shows no main effects or interactions involving gender.

The factors that emerge as most important to increasing dream control are successful response to lucidity training, and the number of dreams available to the subject for training practice. Possibly the trends toward expanding sex roles have, in the university students of 1987, virtually eliminated the differences in mastery and expression which used to characterize sex roles.

The results regarding gender are minimal enough to justify the same theoretical explanations of dream meta-cognition for both sexes. While content pre-occupations of the sexes may differ somewhat, the processes of self-regulation under investigation here operate independently of specific contents.

Summary. Study 2 provides data which help to answer the

central research questions, and generally do so according to the hypothesized relations.

1. Meta-cognition in both self-reflective and intentional forms is not exclusive to waking. Both occur spontaneously in dreaming and vary in degrees that are normally distributed. Lucid awareness of dreaming while dreaming occurs spontaneously in 1% of dreams of university students. Some of these spontaneously lucid dreams are characterized by high level dream control.

2. Dreaming is not isolated from waking. Rather, similar processes of self-aware regulation occur within and across waking and dreaming. Extant levels of these forms of dream meta-cognition can be increased by increasing attention to dream detail during waking. Further increases can be achieved through targeting high level self-reflective and intentional dream behaviors and rehearsing their contingencies during waking. There is also evidence that dream experience can directly inform a waking perspective.

3. Individual differences in dream recall frequency, attitudes, and habits regarding dreaming, influence levels of self-reflectiveness and control in spontaneous dreaming. The effects of individual differences are attenuated when attention is educated to dream processes. This re-organization of attention accounts for more variation in these aspects of dream self-regulation than do individual differences. It appears that such dream skills are learnable.

by most subjects who appropriately deploy their attention.

Treatment effects were always stronger than individual difference effects in accounting for variation in dream self-reflectiveness and dream control. Still, group effects are not large. This was expected since there was no attempt to recruit interested or experienced subjects, or to know the contingencies of the current life situations which undoubtedly cause temporary fluctuations in dream self-regulation. A smaller study, or a more clinically oriented one could start to deal with this kind of variation, as well as developing the clinical applications of dream self-regulation.

Implications.

This research has pursued a view of dreaming and its relationship with waking that is broad enough to subsume the variety of dream phenomena that have been observed yet not accounted for theoretically. It has also attempted to provide data to support the view developed. The following discussions are rooted in implications that are close to the data and extend to those of a more general nature.

Much of dream theorizing continues to define dreaming in terms of limits not shared by normal waking consciousness. While there have been many occasions when a dream report will defy some arbitrary statement of what is impossible in a dream, theorists continue to make these

statements. In very recent writings, some authors have recognized the seminal impact that the discovery of lucidity has on the study of dreaming (Globus, 1987; Rossi, 1986). Others continue to insist that dreams are always unconsciously generated, that we "kiss ourselves good-bye" when we dream, and that we are only capable of reflecting on dreams from the perspective of waking (Jones, 1987). The more middle position encountered is that occasional lucid dreams occur but they are disconnected or at variance with the 'rules' of ordinary single-minded dreaming (Foulkes, 1985). Dream control is viewed with similar bias.

The demonstration of the range of dream control and dream self-reflectiveness is evidence that ego control is not suspended during dreaming as is commonly thought by psychoanalytically oriented thinkers. The dream ego interacts with the dream environment in such a way as to reveal the breadth of self-regulatory activity of which the dream ego is capable. In addition, these abilities may be expanded upon through learning.

It appears evident that the notion of dream isolation (Rechtschaffen, 1978) has been over-extended, and that dream processes are actually responsive to influence from waking. This has been demonstrated for a young population, minimally invested in dreaming, yet relatively open to learning.

The preliminary evidence for dreaming to waking

transfer effects further weakens the idea of such extremely state specific cognition as is posited by the notion of isolation (Rechtschaffen, 1978) or necessary regression (Koukkou and Lehmann, 1983). Through the mechanisms of attention and intention specifically deployed from waking, the dream can demonstrate greater meta-cognitive capacity. The implication for the Activation-synthesis Hypothesis (McCarly and Hoffman, 1981) is that a greater role in dream generation must be attributed to cortical feedback and top-down processes. There are similar implications for Crick and Mitchison's idea that dreams are noise.

The state-shift theory (Koukkou and Lehmann, 1983) is brilliant in terms of its conceptualization of states which are so similar to one another that they shift via the orienting response to the next state in a way that is virtually continuous. This theory is compatible with the present characterization of self-reflectiveness in that increments in self-reflectiveness may well consist of orienting responses to new information. Both the occurrence and the recognition of bizarreness within the dream may be 'oriented' to, and the functional state may have shifted slightly due to this orientation. Similarly, a state shift likely occurs when the dream is recognized as such and the dreamer orients to this new insight. The research on the electrophysiology of lucid dreaming shows that it occurs in the most activated periods of REM sleep and is thus

consistent with Koukkou and Lehmann's association of the orienting response at the time of a state shift, with increased activation. The inconsistency in the state-shift theory is its psychoanalytically derived reductionism with regard to dream cognition. The present data do not support the idea of all dreams as regressions which are incapable of self-reflection. Fortunately, the theory would not be diminished by modifying an overly simplistic interpretation of the relationship between dream cognition and EEG frequency.

This experiment demonstrates several aspects of the mechanisms by which information is transferred between waking and dreaming, or by which information is or becomes common to both states. The results are supportive of a feedback loop between states, mediated by attention, and by which both states can co-evolve (Rossi, 1972). According to the theory developed in this paper, this co-evolution accounts for differences in high and low frequency dream recallers in aspects of both waking and dreaming performance. High recallers are thus seen as more 'state interdependent' in that the 'isolation' between states and their experiential and cognitive domains (Rechtschaffen, 1978) is overridden by mutual access to broadening information bases, achieved through attention to dreaming as opposed to inattention. This mutual causal learning effect increases the cognitive and experiential range of each

state by virtue of the increasing overlap and interaction with the other state. Rather than a domain of experience and cognition which is state specific, the sleep/wake system has moved to relative state interdependence in experience and cognition.

The experimental use of high and low frequency recallers was helpful in establishing some validity for the notion of state independence. The tendency found in the research literature for high recallers to be more cognitively flexible during wakefulness (Austin, 1971; Bone and Corlett, 1968; Sheldrake and Cormack, 1974; Shonbar, 1965) was somewhat supported by the present results in view of high/low differences in private self-consciousness (although not in anxiety or in public self-consciousness), and in behavioral and attitudinal differences toward dreaming. The tendency found in the empirical literature for high recallers to be more psychologically differentiated (Goodenough et. al, 1974) and/or cognitively flexible than low recallers has been extended to their dreaming in some studies (Purcell et. al., 1986; Sheldrake and Cormack, 1974; Wallin, 1977), and this extension is replicated by the present results even though these differences are small. Specifically, there are significant baseline differences between high and low recallers in dream self-reflectiveness and dream control, and significant self-reported differences in attention to dreaming and in dream abilities. These

findings are interpreted as at least in part the net result of habits of attention and inattention to trans-state experience. This waking/dreaming continuity is the basis for attempting to influence dream processes from the vantage point of waking and through the mechanism of educating attention. The success in so doing further supports this interpretation of baseline differences in high and low recallers. Post-test findings that high recallers report significantly more dreaming to waking transfer effects than do low recallers are an additional aspect of the mutual causal system put forward here. Attention to dreams and their various aspects feeds back on subsequent dreaming and it in turn feeds back on subsequent waking. The measurement scales used in this experiment show that this feedback is concerned with abstract high level self-regulatory processes such as self-reflectiveness and intentionality, and may well involve other such processes were they to be investigated. The data reveal a picture of psychological organization which is dynamic, potentially self-regulating and ready for re-organization when attention is allotted. Using the methodology developed by Moffitt and Hoffmann (1982, 1986) to index the organization of state electrophysiologically, an independent test of the dynamism of this organization could be made. Increased state interdependence in low recallers, as a function of increased attention to dreaming, should result in increased similarity of pre- and post-

awakening states.

Thus, attention and self-regulation are seen as occurring during waking, during dreaming, and across waking and dreaming from the vantage of the larger system comprising the person in all states.

Conclusions

It has been shown that dreams provide at least as much opportunity for volition, overt action, self-expression and self-reflectiveness as does waking life, and that the dream ego responds to dream generated situations the best it can. Not only are attentional and intentional systems variably operative in dreaming, as they are in waking, but the dreamer is an active participant in the dream creation process through his active, conscious encounter with his phenomenal world in both dreaming and waking. The constraints on this response are implicit in the organization of the dreamer. The lifting of these constraints, or the re-organization of response, is effected through the mechanisms of attention and intention on what is to be re-organized. This is true even from the other side of the sleep/wake boundary. High frequency recallers have shown that an openness to dreaming may alter dreaming itself. Low recallers have shown that openness to dreaming is not only the prerogative of high recallers.

The constraints on this response are therefore not implicit in dreaming itself, although this view of dreaming

has been widely held. Dreaming has unfortunately been defined in terms of limits not shared by normal waking consciousness. The demonstrations of dream self-regulation made possible by the Dream Self-reflectiveness and Dream Control scales would have been difficult previously, in the near absence of adequate instrumentation. Again, the lack of such instrumentation was embedded in a conception of dreaming which did not permit seeing many similarities between waking and dreaming experience, to the point of calling 'anomalous' and non-ordinary' abilities perceived as exclusively waking ones. By broadening our view of what is possible, we enable ourselves to discover it, understand it, develop it, and so we further organize our experience, awareness and behavior.

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APPENDIX A

Scoring manual for Self-reflectiveness scale

This dream scoring scale is taken from Rossi's (1972) theoretical self-reflectiveness continuum. Some adaptations have been made for its use in the present research.

1. Our use is not clinical and we do not use the subject's waking associations to any dream content as part of the scoring procedure. All scored elements are explicitly stated in the dream report. No interpretations or inferences are made, therefore dreams are assessed conservatively.

2. Similarly, no attempt is made to evaluate bizarreness or uniqueness of dream images from the perspective of a clinician or observer, nor even from the waking perspective of the dreamer. Bizarreness is defined only from the point of view of the dreamer within the dream. The self-reflective process in dreams is seen by us as essentially a process of the dream ego and its awareness.

3. Consistent with this idea, transformations (category 6) are limited to those in or of the dreamer, and exclude those in other dream characters or in the dream environment.

4. Similarly, if the dream ego is submerged into a group ego, so that the dreamer is hardly differentiated, the self-reflectiveness is not attributed to him. This type of dream is typically signalled by continuous use of 'we'. Only that which accrues to the dreamer is scored.

5. Categories 8 and 9 on our scale represent for Rossi, subsets of category 7 (multiple levels of awareness). We extended the scale by adding two more categories for the most highly self-reflective of the 'multiple levels' dreams (dream control and lucidity).

INSTRUCTIONS TO JUDGES

There are no minimum criteria for what constitutes a dream. Any experience which took place in sleep and is described in a dream report is scorable, even if it is simply one image. However, editorial comments that are not recalled dream material are ignored for rating purposes. The scorable part of the following excerpt is bracketed:

e.g. I don't usually have dreams like this. (I didn't know anyone in the dream. I didn't seem to have any urge to find the girl's killer.)

A high percentage (about 90%) of dreams reach a scoring criterion of agreement by 2 out of 3 trained judges on the first round of rating. The level of disagreement is somewhat higher if only 2 judges are used and perfect agreement is the scoring criterion. The ordinal element of the scale makes a dichotomous agreement/disagreement criterion an overly conservative one since in actuality, ordinarily close ratings represent more agreement than distant ones.

Discussion is used to resolve dreams with discrepant ratings. Judges give reasons for their rating which typically results in one or more judges recognizing the cue they missed in the dream report. In the case where there is definite disagreement, the highest category common to all judges is used. The less satisfactory alternative is to exclude the dream from data analyses.

SELF-REFLECTIVENESS SCALE

1. I was not in the dream, I watched a scene with no people in it.

In this category the images are objects of the dreamer's attention only; he is not present in the dream, even in the role of observer.

e.g. A fly was walking on a ceiling.

e.g. A tidal wave threatened the coastal areas.

e.g. I heard a song I didn't know.

2. I was not in the dream, but I watched a scene with people, and/or things that are familiar to me.

Again, the dreamer is not present, even in the role of observer.

e.g. My mother cleaned my closet.

e.g. Just an image of a place in the woods near my home.

e.g. The dream had no picture, just the sound of the lullaby my mother used to sing me.

3. I was extremely involved in the dream. I had a task and/or was involved in ambitions that commanded all of my attention.

In this category, the dreamer is present and participating in the dream. Although this participation may at times be fairly passive, the dreamer is caught up in the dream drama.

e.g. I was trying to attract the attention of this pretty girl.

e.g. I am working at the office.

e.g. I wanted to call out for help but I seemed unable to do so.

4. While present in the dream, I looked on, a silent observer to the dream drama. I was thus able to reflect on the content of the dream.

In this category, the dreamer's role is predominantly one of observer. He is actually present in the dream. While he is in a position to reflect on dream events, the dream is scored in a higher category (5) if he actually does so. Category 4 represents detachment and the potential for reflectiveness. Often the dreamer is watching a movie or seeing things through a fog, a mirror, or from a great height or distance.

e.g. I was in a theatre watching a war movie.

e.g. From the airplane I looked down at the landscape below. I could see my house and my school.

e.g. I was suntanning on the lawn. I looked into the grass and watched a tiny ant as he struggled up and down over the blades of grass, carrying something twice his size.

Note: "It was like a spy movie..." with no mention of self, does not score in this category.

Sometimes judges will have difficulty agreeing on whether a dream should be score 3 or 4, as they did with this dream:

e.g. I was at an airport and I was watching my sister get on an airplane. I just seemed to be standing there and I was crying.

In such a case the scoring procedures outlined in the INSTRUCTIONS section should be followed.

5. This category concerns reflection, communication and the use of language in the dream.

5a. I thought over an idea

and/or

I decided what I would do next, and/or I made a plan
and/or I logically deduced something.

e.g. I couldn't understand why the animals were made to suffer so.

e.g. I thought about getting my hair cut.

5b. I had an interaction with someone else that involved words and/or definite communication.

e.g. We talked about whether I should marry John or not.

e.g. I saw a sign which said, "Beware of the dog."

If the dreamer is one of the parties in the communication, even if he says nothing, it is sufficient if the topic of the conversation is indicated.

e.g. Without words, he transmitted the idea to me that all was lost.

If the dreamer is not involved in the conversation, but overhears it, it is necessary for the words to be explicit in the dream report.

e.g. I overheard them saying that my clothes looked funny.

It is not sufficient if only the topic of the conversation in which the dreamer is not a participant is explicit, nor if a conversation in which the dreamer participates is merely alluded to.

e.g. They were telling jokes (is scored 3 not 5).

eg. We talked for a while (is scored 3 not 5).

6. This is the category of multiple states which are not simultaneous but which both occur in the same dream.

6a. I underwent a physical transformation in the dream (e.g. from human to animal, sick to healthy, from one chronological age to another)

and/or

I underwent a psychological transformation in the dream (e.g. from one feeling to another, from one role to another).

Therefore:

e.g. I was back at 3 years old in the dream (does not score as category 6)

but

e.g. In the dream I was first a child then later an adult (does score as category 6).

The transformation must be in the dreamer and not just in the environment or another dream character.

e.g. I went from hot to cold.

e.g. At first I was angry at him, but then I felt "sorry for him.

Judges must be careful not to see a simple litany of activities as role changes.

e.g. We went shopping and later on we were at a football game (is not scored as category 6)

When the activities are polarities with respect to one another such as spectator/participant, lover/enemy, ugly duckling/swan, they may more properly be seen as roles.

e.g. My dad and I were in the bleachers cheering the hockey team. Then the coach asked us to come and play so we did. We played superbly and our team won.

6b. I dreamed I was someone else and/or someone else was me.

and/or

There was more than one 'me' in the dream.

and/or

I was ambivalent, and felt aware of two distinct states.

e.g. I was talking to a little girl who looked just like I did when I was little.

e.g. I saw myself in a mirror. I was wearing a sailor suit.

e.g. I was extremely happy about being pregnant, at the same time I was very scared and in a lot of pain.

7. In this category two states or perspectives of the dreamer are interacting simultaneously.

7a. I am participating in the dream, yet also watching, apparently simultaneously.

e.g. The bullet went through me and I watched myself die.

7b. I was thinking or talking about myself, about my feelings, thoughts or behavior (self-reflection).

e.g. I wondered why I had shouted at her when she had done nothing to me.

The dreamer must self-examine or self-reflect; simply making plans or describing feelings does not constitute this level of self-reflectiveness.

e.g. I thought I would go to the ball game (is scored as category 5 not 7).

Some explicit self-reflections are quite subtle.

e.g. I really regretted not having told her what I knew.

e.g. I noticed I was not dressed properly. (where the subject is evaluating the appropriateness of own his behavior, is more self-reflective than "I realized I had forgotten my ski boots." (which scores as category 5)).

The reflection must take place explicitly in the dream. Sometimes subjects give reasons for their dream feelings or behavior which are likely from the waking perspective or some past perspective. To score 7b the self-reflection must be overtly in the dream report, so that the dreamer must reflect on rather than merely state reasons for his feelings or behavior.

7c. I noticed while I was dreaming that something was odd, bizarre, irrational, shocking or erroneous was part of the

dream content.

The bizarreness must be noticed by the dreamer within the dream, and not simply seen as odd from the waking perspective.

e.g. It struck me as odd that the house was not on the corner where it should be.

e.g. I surprised me to see him wearing his jeans when I had thrown them in the garbage yesterday.

The dream report will often contain editorial comments which present the waking perspective. These do not count as recognition of the oddity within the dream. Typically, the dream is recounted in the past tense and the waking perspective is put in the present.

e.g. My mother was there which is strange since she's been dead for ten years. (The recognition of oddity did not take place within the dream)

e.g. My mother was there which I thought was odd since she's been dead for ten years. (The recognition of oddity takes place within the dream and is scored as category 7).

7d. I saw and/or felt myself lose consciousness or die in the dream, yet I was still observing the dream scene.

and/or

I dreamt I was asleep dreaming, and woke up, still inside the dream (false awakening).

e.g. I laid down on the grassy hill and went to sleep and dreamed I was back home again.

✓ e.g. I dreamt I woke up and got dressed for work (false awakening).

e.g. I dreamt I told her a dream I had about her.

8. This category describes two types of dream control, control in the dream and control over the dream. Some people can have control over a dream without explicitly realizing that they are dreaming.

8a. I woke myself up from a nightmare.

In the case of awakening from a bad dream, the awakening must be intentional.

e.g. I couldn't stand it any longer so I woke myself up.

8b. I was controlling/composing some of the dream while I was dreaming

and/or

I was analyzing the dream's meaning while dreaming

e.g. I didn't want Jill dead so I brought her back to life.

e.g. I was able to materialize objects and make them disappear.

e.g. A policeman and a school principal turned up with my father and I realized all this had something to do with my reaction to authority figures. I waited with interest to see what they would do next.

8c. I spent most of the dream trying to rectify a situation and I finally did.

Control in the dream is only scored if it is conspicuous, i.e. the effort is repeated, continuous and successful.

e.g. I overcame obstacle after obstacle until finally I rescued my daughter from the attackers.

9. I was dreaming and while I was dreaming I knew I was asleep and dreaming. and/or I knew I was having an out-of-body experience.

and/or

I realized I was asleep and dreaming for a fleeting moment before I woke up. (or any version of fleeting lucidity)

and/or

I knew I was asleep and dreaming, and realized I could do whatever I wanted, so I proceeded to direct the dream.

This is the category in which all lucid dreams are scored, both fleeting and prolonged, and with or without control.

e.g. Suddenly I realized I was dreaming and I woke up.

e.g. I knew I was dreaming and decided to have some fun flying. I turned myself into a whooping crane and soared off.

Note: Category 7b has been added since Purcell et. al., (1986).

APPENDIX B

Dream Intentionality/Control Scale

This scale attempts to measure the ordinal process along which dream control progresses. It begins with the dreamer's having no role in the dream, passes through minimally to well developed role with increasing effectiveness, and ends with the dreamer's being lucidly aware of dreaming and exercising conscious control over his own role and/or dream content. The following are examples of lowest, mid-range, and highest scoring dreams on the control dimension.

(lowest) The police chased a man down an alley.

(mid-range) The police were chasing me for something I didn't do and they were getting closer the faster I ran.

(highest) As soon as I realized I was dreaming all the anxiety of this chase left me. I turned and faced the policeman and changed them all into butterflies.

The scale scores ascend with the progression of several strands of the 'control' construct, specifically, the dreamer's activity level, his/her centrality to dream events, his/her emotional expressiveness, behavioral autonomy and assertiveness, the cognitive level of his/her intentions and choices, and his/her effectiveness or mastery. Since the dreamer's mastery and control of dream situations implies his cognitive and behavioral autonomy, activity and centrality are achieved at lower levels of the scale than are mastery and emotional fulfillment. Thus, activity that is peripheral to main dream events does not score as high as activity which affects dream outcomes, and a dreamer who is the main protagonist but cannot seem to act scores lower than a dream ego which struggles to deal with the dream situation.

While the scale is ordinal in that dream control is rated from none through a little, to a lot, each level (category) is described by combinations of elements which are nominal in nature. This is done to aid the raters and their reliabilities, and to avoid the tendency to make inferences, interpretations, approximations, guesses, or subjective estimates as to where on the scale a dream fits.

For nearly all dreams, disagreements in the first round of independent ratings are easily reconciled by discussion. Usually a rater has simply not noticed certain information which would have affected his scoring. However, in the event that an unresolvable disagreement should occur, a form of

arbitration (such as using the middle score) should be used. Discrepant ratings are usually only one category apart. Exact agreement from two raters is therefore an overly stringent criterion. A criterion of exact agreement by 2 out of 3 raters is therefore recommended.

Instructions to Judges.

What to Score

Score the dreamer, his role, his control over his role and its effects on dream events and outcomes. Within the context of each dream report, evaluate the dreamer's participation in terms of its centrality to dream events and its effectiveness in bringing about a desirable outcome. Evaluate the extent to which the dreamer is emotionally expressive to other dream characters, and the extent to which he is able to assert himself behaviorally. Sometimes dreams present a problem or conflict which requires the dreamer to take cognitive control or find a solution by seeing a way out of the difficulty, developing a plan, or deducing an answer through clues.

Activity is referred to in a broad sense and includes reflective activities such as feeling, talking, thinking, and empathizing. The importance of these dreamer activities is of course relative to the dream situation, that is, are they central or peripheral, successful or not.

Centrality refers to the relative importance of the dreamer's role to the main drama. When s/he is predominantly the observer, the dreamer's role is peripheral (category 3 or lower). When s/he is essential to the main dream drama, the dreamer's role is central (category 4 or higher, depending on outcome). When the dreamer's thoughts and feelings constitute the main dream events, category 4c is scored. When these thoughts are peripheral to the main dream action observed by the dreamer, 3a is scored. Sometimes the dreamer's thoughts and feelings as he observes a drama are developed enough in the dream report such that both aspects seem equally central. Such a dream will ultimately be rated in accordance with majority opinion.

Autonomy is sometimes difficult to evaluate due to the easy confusion of dependency with mutuality and reciprocity. The issue often pivots on the use of 'I' or 'we' and these pronouns must be studied carefully in order to assess whether the dreamer simply has company while he does something, or whether his autonomy is entirely submerged into that of the group. If the dreamer uses 'we' more frequently, the text may offer little justification for assuming the dreamer's autonomy of action.

Expressiveness is an aspect of how the dreamer impacts on his dream environment. Feeling expression in the description of the dream shows the meaning of events for the dreamer. Without it, the rater sees only a series of meaningless actions which score low in terms of dream control.

Scoring Ambiguity

Each dream gets one score which reflects the category of dream control most applicable to it. The score is for the most part a global one, although some of the category descriptions weight outcomes more heavily than beginnings. **Indicate the subcategory which guided your score.** You are always seeking a best fit. In cases which are difficult to decide pay special attention to ending or outcome in a dream which has relative narrative coherence.

Remember to score what actually occurs in the dream rather than in the history or background to it which the dreamer might include in the report. This is necessary to avoid a spurious evaluation of level of dream control. For example, some reports might include a characterization of the dreamer as Superman, yet attention to dream action shows that Superman is inert or dependent and not at all masterful.

Multiple Dreamer Roles

The heroic efforts of other dream characters are irrelevant to the control dimension as it is defined here. Score only the dream ego. On occasions where the dream ego becomes one of the other dream characters, any dream influence from that character that occurs during the period of identification, and that period only, accrues to the dream ego. Dreams in which there are two or more dream egos for the duration of the dream are scored on the basis of the highest scoring dreamer identity. When the dreamer is watching himself, for example, often the observed self is engaging in higher scoring activity than the self which is simply observing.

Inference

It is important that the rater not infer the level of dreamer control but rather depend directly on what is explicit in the dream report in accordance with the category descriptions which follow. Inference is commonly a problem with very brief dream reports which are not explicit about the dreamer's role, although some short reports are quite explicit. Information which is not manifestly in the report cannot be scored.

THE SCALE (To aid in clarification, the first example for each level [in brackets] is always a version of the police chase dream cited above.)

1. The dreamer is not present in the dream. [The police chased a man down an alley.]

e.g. A horse galloped across a field.

e.g. Just this strange music playing.

e.g. A scene of the bedroom I had when I was little.

e.g. An angry crowd was going to lynch some poor man.

2. The dreamer is present in the dream as an observer and reporter of events. He does not participate, nor does he report his own thoughts and feelings on dream events. [I watched the police chase a man down an alley.]

e.g. I sat in a theatre and watched a movie about India.

e.g. I came around the corner of my house to put out the garbage and witnessed a terrible scene

3. The dreamer is present predominantly in the role of observer, but is more involved personally than the 'objective reporter' of the level 2 dream. [I watched the police chase a man down my alley and wondered if he were innocent or guilty.]

3a. The dreamer in a peripheral role may register thoughts and feelings regarding main dream events which s/he does not act on or express to any other dream characters.

e.g. From the beach we saw a girl who seemed to be drowning. When the lifeguard was trying to resuscitate her I could hear a radio blaring and thought how incongruous it sounded.

3b. The dreamer's role is mostly that of observer, although s/he may engage in some activity which is peripheral to or does not influence main dream events.

e.g. I moved the chair over to the window so I could see them quarrelling as well as hearing it. When he accused her of seeing other men she threw her coffee at him and he lunged at her as though to hit her. In the end he threw down something in an envelope and stormed out.

3c. The dreamer seems central but is so passive or inactive as to really be in the role of observer, with other characters creating the action. The dreamer may function almost like a stage prop in the dream drama.

e.g. A famous stylist was doing my hair. He told me he would make me beautiful for my boyfriend.

3d. The dreamer acts as part of a group; at no point in the dream does s/he act individually or have a separate autonomous role.

e.g. We all stood there watching the man kill this girl. We went up to her after but she was already dead.

e.g. My friends and I drove around. First we went to the beach and saw some pretty girls so we convinced them to come with us....

4. This category marks the beginnings of the dreamer's role in effecting and affecting events. The dreamer is central or is a protagonist of the dream action but control or expressiveness is low, minimal. The dreamer participates but is weak, ineffectual or dependent. His/her participation typically lacks effort or courage or the attempt to find alternatives. [The police were chasing me. I was cornered in an alley with no chance of escape.]

4a. The dreamer is a victim without recourse or lives with the consequences of the acts of others. The dreamer may seem paralyzed to act.

e.g. A man was going to kill me and I couldn't do a thing to stop him. Thank goodness I woke up.

e.g. They were so slow I couldn't do anything but just wait there and I thought, "They really ought to have their act more together."

4b. The dreamer participates in central events and has his own role beyond that of observer but is usually passive or dependent; another character makes the decisions or pulls the dreamer through things. The dreamer's actions may be limited to obedience. This differs from category 3c in that the dreamer is more active.

e.g. My older brother and I decided to leave home in the middle of the night. He had packed our stuff. I had lost the tickets but he found them under the bed.

4c. The dreamer and his thoughts and feelings are central but not shared or expressed to other characters; there is no resolution; the dreamer may handle bad feelings by running away, avoiding confrontation.

e.g. The scene made me terribly depressed so I just got in my car and drove.

4d. The dreamer knows what he wants and may express this to another character but s/he does nothing to get it; the dreamer intends to act but then does not.

e.g. I was just about to try to jump in and save her but the marble statue rescued her instead.

4e. The dreamer is central but the situation is inert, requiring little of the dreamer, who does little to activate the dream or enhance his role. Occasionally the dream has an elaborate potential situation, but very little really happens.

e.g. I was hanging around outside the drugstore.

e.g. I was a cop on a stakeout. End of dream.

4f. The dreamer does not describe his dream action enough to imply a higher level of dream control. Such dreams often (not always) seem trivial. Often (not always) the report follows the simple pattern "I.....(did something)" with little indication of intentionality or outcome. "Conversation is banal or trivial"

e.g. I dreamt I blew my nose.

e.g. I dreamt about cutting the grass.

e.g. I dreamt my job was to intercept certain information from the KGB.

e.g. I asked her a question.

5. Control in dream situations is moderate due to various mixtures of effort and success/failure. The dreamer's impact is more expanded than at level 4, because the dreamer is trying (often unsuccessfully) to be more autonomous, expressive, involved or effective. Typically, the dreamer's participation is more effortful than at level 4. [The police were chasing me for something I didn't do and they were getting closer the faster I ran.]

5a. The dreamer is active and shows some focused behavior but

is only partially or occasionally effective or the results are ambiguous. The dreamer may fluctuate between adequacy and inadequacy; between effectiveness and ineffectiveness; action and inaction.

e.g. Somehow, every problem child in the whole school ended up in the class I was to teach. Miss Clough came in and agreed that I had every problem. I wanted to cry because I was in a portable and no principal would support me out here by myself. I began to discipline the children physically. It felt so foreign to me.

5b. The dream situation outpowers the dreamer's efforts; s/he tries, but does not rise adequately to the situation. Frustration is frequently expressed.

e.g. The waitress would not serve any food to the Black man. I was enraged and went to get some for him myself. They wouldn't let me so I tried over and over to trick them and they took plate after plate of food from me.

5c. The dreamer tries to think but gets confused.

e.g. I was trying to remember the name of the street where Marc lived. The streets on the map didn't seem to match with my memory of the town.

5d. The dreamer is somewhat communicative/expressive of his thoughts, intentions and feelings to another character but is not very effective.

e.g. I tried to talk the guy out of it but he did it anyway.

5e. The dreamer is split, ambivalent or undecided about what to do. Any action taken is not based on a weighed evaluation.

e.g. I was sitting and talking with Jane and chain smoking and having a good time. Part of me was watching and nagging me about the evils of cigarettes.

5f. In carrying out the instructions and intentions of others, (e.g. doing a job) the dreamer is focused and successful.

e.g. I was supposed to be taking all the green socks off the conveyor belt and pairing up the ones of other colours. They were going by quite fast so I had to concentrate but I was doing okay.

5g. The dreamer is successful in a mutual or reciprocal venture. They may talk together, sharing thoughts and feelings.

e.g. My lover and I got along well together.

e.g. George held one end up while I lowered the other end down the stairs. Between the two of us the job got done.

6. The dreamer becomes in control to a large extent. Usually there is a relatively positive outcome from the dreamer's actions. The dreamer is central and effective, but not maximally so. [The police were chasing me down an alley. I hid behind a door.]

6a. The dreamer brings the dream situation under control but solutions are banal, simplistic, incomplete, impulsive, tenuous or temporary.

e.g. The jerk was bugging me so I shot him.

e.g. I gave the stray cat some milk and it began to purr.

6b. Strong good feelings may dissolve into ambiguity.

e.g. I was feeling great, I played so well. I then asked the coach for a job and he said I could be bat boy. I was bewildered.

6c. The dreamer makes a continuous or impressive effort or is fully expressive of thoughts and feelings but the outcome is unclear or ambiguous.

e.g. I practised the "Moonlight Sonata" over and over. I don't remember if I got it right.

6d. The dreamer is effective without any apparent effort, emotional investment, thought, or act of will.

e.g. I fell down the mountain but seemed to land safely.

6e. The dreamer expresses mild good feelings or amusement at a positive outcome; or the dreamer evokes mild/moderate laughter/pleasure in others through his/her wit/talent.

e.g. I was enjoying watching the children play.

e.g. I kidded Joe by asking him if he knew for sure what day it was, and he laughed. (In real life Joe came to work on the wrong day last week)

7. The dreamer gains full control of himself and the dream situation. The dreamer excels, is fully expressive and assertive, or central and effective. His response to the dream situation may be creative, innovative, heroic. [The police were chasing me down an alley. I was able to outrun them all and scaled the wall easily. I laughed when I realized I had lost them.]

7a. The dreamer brings the dream situation fully under control with no unfinished business.

e.g. I dreamt I had successfully defended my thesis and was attending my graduation ceremonies.

7b. The dreamer expresses feelings to their fullest extent with exciting or satisfying or experientially luminous results for the dreamer; strong good feelings; laughter.

e.g. I sang a song of great beauty and it was a wonderful pleasure both to sing and to hear.

e.g. The news was broadcast over the radio that Ricardo Montalban had just come down from 162 days on a flagpole. I laughed and laughed and I was still laughing when I awakened.

7c. The dreamer may execute an explicitly thought-through plan or execute a decision based on choices and/or awareness of the intentionality of others. He may express pleasure or self-congratulation at his course of action.

e.g. All the children were somehow expecting me to get them out of this. I couldn't just leave them there with the guerrillas coming, so I hijacked a plane to come and take them to a safe island I knew, then I paid the pilot. If he brought back trouble we would be gone anyway.

7d. The dreamer may start out weakly but increases power and control as the dream progresses; s/he breaks through from weakness to strength. The dreamer may make a continuous or impressive effort and finally succeed.

e.g. I was supposed to marry Michael Jackson but I didn't want to. The wedding preparations were underway and everyone said I had to do it. Finally I yelled out "NO!" and woke up.

7e. The dreamer may solve the dream problem with a flash of insight or deductive process.

e.g. In a flash I finally realized what all the clues meant. The three old ladies whose ages I was to judge were

actually my own relatives! The lady with blue hair was my grandmother; the plump lady was my mother and the one with the cane was her older sister.

7f. The dreamer has great ability or power over him/herself and is powerfully influential.

e.g. My sister was afraid but I convinced her she could learn to fly as easily as I could. I held her hand and we flew off.

e.g. I finished my song and the crowd went wild with applause.

8. This category goes beyond 'control in' the dream and beyond self-control, to 'control over' the dream. The dreamer has control over the dream content or part of it, or may manipulate dream mechanics as would a film director. This is done without any explicit statement of dream lucidity. [The police were close on my heels. I thought of a secret hiding place which was quite far off. I slowed the dream down to give myself a head start, and I got to safety in plenty of time.]

8a. The dreamer may compose the dream, redream the dream, slow the dream down or stop the action in order to interfere with the course of events, or change the ending. The dreamer may be able to will changes in things and other characters. S/he may be able to materialize objects, or make them disappear.

e.g. I didn't like her dying so I changed it by bringing her back to life.

e.g. She was wearing this hideous green dress. I willed it to be red and suddenly it was red.

e.g. I seemed to be inventing this dream about people on another planet as I went along.

8b. The dreamer may choose to wake up.

e.g. Just when the truck was going to roll over me I suddenly decided to wake myself up and I did.

9. This is the category wherein dream control occurs in the context of explicitly stated dream lucidity, or, of explicitly stated out-of-body experience. The dreamer knows

s/he is dreaming (or asleep and thinking) while s/he is dreaming and consciously attempts to exploit this power. Lucidity in which the dreamer exercises no attempt at dream control does not count. However, the entire range of lucid control is contained in this one category, including low levels. [As soon as I realized I was dreaming, all the anxiety of this chase left me. I turned and faced the policemen and changed them all into butterflies.]

9a. The dreamer attempts to control some aspect of the dream as a direct consequence of recognizing the dream state. He may or may not succeed.

e.g. Because I knew I was dreaming I decided to fly to Hollywood and have sex with my favorite movie star.

e.g. I had an out-of-body experience. I hovered above my body as it lay sleeping in the bed. This was boring after a while so I decided to visit my brother in Vancouver and I flew out the window.

e.g. I was relieved to realize that I was dreaming and that this dreary problem was an unnecessary bore. So I turned my back on the scene and went into another dream.

9b. The dreamer may make an explicit decision not to interfere with dream events or an explicit effort/intention to remember this special dream.

e.g. Then suddenly I realized I was dreaming and decided to conduct a little experiment by not trying to do anything at all, just watching to see what would happen.

e.g. In the dream I thought, "I must remember to tell this dream to Lucy."

9c. The insight of lucidity itself may result in a form of control without further intention by the dreamer. The dreamer may gain self-control or the dream may change/resolve as a direct consequence of recognizing the dream state.

e.g. When I realized this was a dream all my fear evaporated.

e.g. Many small details were wrong and this was puzzling me. Steps were too low or too high. We were in a university course with students I knew to be in high school. Suddenly I realized this was a dream. The steps returned to normal and the students were in their correct classes.

APPENDIX C
INITIAL QUESTIONNAIRE

First answer the questions. Then, if you would like to participate further in this study, please complete the following:

Name _____

Home phone _____

Work phone _____

Can you come to the university one evening a week for three weeks? _____. If so, circle the evenings on which this would be possible for you.

Mon. Tue. Wed. Thur.

YOUR SEX _____

YOUR AGE _____

1. Typically, how often do you remember your dreams upon awakening in the morning? (check one)

- _____ Rarely-once a month or less.
_____ Infrequently-one to four times per month.
_____ Sometimes-one to two times per week.
_____ Often-two to five times per week.
_____ Usually-every morning with rare exceptions.

2. Do you ever discuss your dreams with another person?

- _____ Never
_____ Rarely
_____ Sometimes
_____ Often

3. Have you ever realized you were dreaming while you were still asleep and dreaming?

- _____ Never
_____ Rarely
_____ Sometimes
_____ Often

4. When you remember your dreams, how often do you:

a) Recall them to have been in colour?

- _____ Never
_____ Rarely
_____ Sometimes
_____ Often

b) Included the experience of emotions?

- _____ Never
_____ Rarely
_____ Sometimes
_____ Often

c) Included speech and/or conversation?

☐ Never
☐ Rarely
☐ Sometimes
☐ Often

4. d) Included sensory attributes such as touch, smell, taste, non-speech sounds?

☐ Never
☐ Rarely
☐ Sometimes
☐ Often

5. Have you ever wakened yourself up from a nightmare?

☐ Never
☐ Rarely
☐ Sometimes
☐ Often

6. Have you ever had an "out of body experience" during sleep? (Where you felt that you were at some distance from your body, ie: astral projection?)

☐ Never
☐ Rarely
☐ Sometimes
☐ Often

7. Have you ever suffered from insomnia in the past?

☐ Never
☐ Rarely
☐ Sometimes
☐ Often

8. When odd things are happening during a dream, do you stop to puzzle about them, that is, do they strike you as odd during the dream?

☐ Never
☐ Rarely
☐ Sometimes
☐ Often

9. Do you ever notice that dreams affect your waking life?

-----☐ Never
-----☐ Rarely
-----☐ Sometimes
-----☐ Often

APPENDIX D

Self-consciousness Scales

Please rate each of the following items on a scale from zero to four, where zero indicates that the item is extremely uncharacteristic of you, and four indicates that the item is extremely characteristic of you. Please be sure to answer all items by circling the appropriate number.

*1. I'm always trying to figure myself out.

0 1 2 3 4

2. I'm concerned about my style of doing things.

0 1 2 3 4

*3. Generally, I'm not very aware of myself.

0 1 2 3 4

4. It takes me time to overcome my shyness in new situations.

0 1 2 3 4

*5. I reflect about myself alot.

0 1 2 3 4

6. I'm concerned about the way I present myself.

0 1 2 3 4

*7. I'm often the subject of my own fantasies.

0 1 2 3 4

8. I have trouble working when someone is watching me.

0 1 2 3 4

*9. I never scrutinize myself.

0 1 2 3 4

10. I get embarrassed very easily.

0 1 2 3 4

11. I'm self conscious about the way I look.

0 1 2 3 4

12. I don't find it hard to talk to strangers.

0 1 2 3 4

*13. I'm generally attentive to my inner feelings.

0 1 2 3 4

14. I usually worry about making a good impresssion.

0 1 2 3 4

*15. I'm constantly examining my motives.

0 1 2 3 4

16. I feel anxious when I speak in front of a group.

0 1 2 3 4

17. One of the last things I do before I leave the house is look in the mirror.

0 1 2 3 4

*18. I sometimes have the feeling that I'm off somewhere watching myself.

0 1 2 3 4

19. I'm concerned about what other people think of me.

0 1 2 3 4

*20. I'm alert to changes in my mood.

0 1 2 3 4

21. I'm usually aware of my appearance.

0 1 2 3 4

*22. I'm aware of the way my mind works when I work through a problem.

0 1 2 3 4

23. Large groups make me nervous.

0 1 2 3 4

*Private self-consciousness items.

APPENDIX E

Report Skills Questionnaire

1. Was there any speaking or talking in your dream?
Yes _____ No _____
2. Were you experiencing any emotion?
Yes _____ No _____
3. Were you experiencing any thoughts?
Yes _____ No _____
4. Was there anything in the dream that struck you as peculiar?
Yes _____ No _____
5. Were you watching the experience?
Yes _____ No _____
Actively participating?
Yes _____ No _____
Both watching and participating?
Yes _____ No _____
6. Was there any colour in your experience?
Yes _____ No _____
7. Were there any other sensory attributes to your experience?
(eg: touch, smell, taste, non-speech sounds?)
Yes _____ No _____
8. Was the experience vivid and striking? _____, normal and ordinary? _____, or vague? _____.

APPENDIX F

Dreaming to waking Transfer Questionnaire (post-test)

Please circle the number which most accurately represents your rating of the following statements. The statements apply to your dreaming during the three weeks of the experiment.

1. Recording my dreams has had
(no effect) 1 2 3 4 5 6 7 (alot of effect)
on my waking life.
2. My dreams have started to become more interesting to me.
(false) 1 2 3 4 5 6 7 (true)
3. During the experiment I noticed I awakened in 'moods' more often than usual.
(false) 1 2 3 4 5 6 7 (true)
4. During the course of the experiment I woke up with ideas or solutions to problems, or ideas and solutions appeared in my dreams.
(never) 1 2 3 4 5 6 7 (frequently)
5. My frequency of dream recall during the experiment was
(less) 1 2 3 4 5 6 7 (more)
than usual.
6. During the experiment I woke up from a dream with an 'impression' of something I should do, like an urge to action.
(never) 1 2 3 4 5 6 7 (frequently)
7. During the experiment I 'rehearsed' some action in a dream that I was later able to execute.
(never) 1 2 3 4 5 6 7 (frequently)
8. Sometimes a dream had the effect of helping me see things in my waking life more clearly.
(never) 1 2 3 4 5 6 7 (frequently)
9. Sometimes a dream had the effect of confusing me about

some aspect of my waking life.

(never) 1 2 3 4 5 6 7 (frequently)

10. Writing down a dream sometimes helped me see a clue or angle on waking life that I hadn't noticed before.

(never) 1 2 3 4 5 6 7 (frequently)

APPENDIX G

Compliance Questionnaire (Schema Group)

1. On average, how many times per day did you rehearse the schema when cued by the leather bracelet?

2. Could you rate how fully you complied with the weekly instructions - 0 1 2 3 4 5 6 7

3. What did you experience when you practiced the instructions?

4. Did this experience go through any changes over the course of the study?

5. Did you have any lucid dreams? How many?

If so, what do you think worked for you?

How did you learn to do this?

Was it anything about the instructions you were taught, or was it something of your own?

6. Did you experience dream control that was more or different than in your dreams before the experiment?

If so, what do you think worked for you?

How did you learn to do this?

Was it anything about the instructions you were taught, or was it something of your own?

APPENDIX H

Group Treatments

These treatments are similar to those used by Purcell et. al., (1986), with modifications for the present research.

Rather than reporting only once at the end of the experiment, Baseline subjects reported once a week to the experimenter just long enough to hand in their dreams and to get new report sheets, in order to maintain basic dream reporting.

Suggestions of dreaming to waking transfer effects were eliminated from treatments, as were any suggestions to the Attention Control subjects of increased recall frequency as a result of the experiment. Instead Attention Control subjects were asked to form opinions on what is the function(s), if any, of dreaming, based on their experience during the experiment. Attention Control subjects were shown through the Sleep Laboratory and some discussion of research methods was introduced.

Some less relevant material was eliminated from the Mnemonic treatment of Study 1 to allow for an expanded dream control entrainment in the Schema group of Study 2. Handouts were also given to this group to enhance treatment effects and to avoid making the sessions longer than half an hour. Order of presentation of material was shifted somewhat in order to better maintain motivation in treatment subjects after the first week. Also for this reason, a discussion of Rossi (1972) was added to session 3 for the Schema group. The Report Skills Questionnaire was filled out after each dream in week one only. In week 2, a set of questions regarding lucidity and dream control was used on the back of the dream report sheets, and in week 3, subjects rated their dreams on the brief form of the Self-reflectiveness scale (Table 2.2). In this way, questionnaires better complemented the treatment sessions.

Instructions to all groups.

1. Keep a pen and paper and these dream report sheets by your bed and record one dream per sheet. You can write the dream in the middle of the night or in the morning when you awake.
2. If you have a vague recollection of a dream that becomes clearer later in the day, write it down and when you get home and transfer or staple it to the proper sheet. Any sleep experience qualifies as a dream.

3. Always have your ID number and date in the allotted space. Dream number indicates the dream of the night. For example, the first dream of a particular night would be dream #1, the second would be dream #2.

4. If you run out of report sheets call me, or come to the Sleep Lab and get some. If these options are not possible, write the report down on a piece of paper with your ID number, the date, and the dream number.

5. I am interested in dreams as they actually occur, so please don't edit or refine your dream report to make it sensible or readable for my benefit. The interests of the experiment will best be served if you write down no more and no less than what you recall of your dream.

6. Please don't discuss any aspect of the experiment with other participants until after the experiment is over.

7. (Baseline subjects). Please return your dream log each week (give date and time).

(Attention Control and Schema subjects). Reread the dream after it is written out. Fill out the questionnaire on the other side of the report sheet for each and every dream. Come next week (give date, time and place) for a half hour meeting and bring in your dream reports so far.

ATTENTION CONTROL GROUP - FIRST SESSION

1. Give basic instructions for all groups with folders containing dream log sheets with report skills questionnaires on the reverse. Ask for every detail that can be remembered without adding any. Suggest that rising 15 minutes or so earlier every morning will be necessary to transcribe a detailed dream experience and fill out the questionnaire.

2. Discuss the mystery of dream recall and forgetting. Discuss habits which facilitate and interfere with good dream recall. Ask for extra suggestions from subjects. Challenge them to see just how much dream detail they can remember, without forcing or adding.

3. Explain that some aspects of dreams appear to be easily left out of reports because subjects might be going too fast or might not think they are important enough to mention. Ask the group for what these details might be and write them on the blackboard.

4. Ask for the different types of dreams and write them on the board. The following are the suggestions which came from subjects from Purcell et. al. (1986). Add these if they are

not suggested.

- nightmares
- recurring dreams
- flying dreams
- daydreams
- hallucinations (in hypnagogic sleep)
- dreams where you meet up with a deceased friend or relative
- incorporation of external stimuli (telephone rings in reality and you incorporate it into your dream)
- colour dreams
- emotional dreams
- dreams where you're watching the dream and in the dream at the same time.
- bizzare dreams

ATTENTION CONTROL GROUP - SECOND SESSION

1. Have a question and answer session.
2. Discuss methods for better recall, such as:
 - rehearse the dream in your mind until you can write it down, but not for too long so that your waking imagination does not fill in any missing details, or so that you won't fall back to sleep if you are lying down.
 - dreams from naps are fine.
 - you can put a tape recorder near the bed and transcribe the dream later if you prefer. This is helpful for dreams in the middle of the night.
 Give a handout which lists these suggestions.
3. Give a definition of what constitutes a dream, that is, any experience or mental content that occurs during sleep.
4. Discuss sleep, sleep stages, their functions and some basic research methods and findings. Tour the Sleep Lab and show how the different sleep stages look on the polygraph record.
5. Ask subjects to think about what might be the function(s) of dreaming, if any, over the course of the week, based on their own experience
3. Tell them about dream theories of memory consolidation and information processing. Ask them to evaluate these notions as they write down the details of their dreams this week. Are they noticing signs of memory consolidation and information processing or do they disagree with these theories.

ATTENTION CONTROL GROUP - THIRD SESSION

1. Discussion period. Ask subjects' opinions about the functions of dreaming after the week's dream collection. Ask them if the extra attention they are paying to dream detail is helping them to answer this question.
2. Talk about dream research and the general cultural inattention to dreaming. Discuss popular notions of dream sharing groups, and the general idea of talking to others about dreams, and relating your dreams to others.
3. Read from Ullman (in Wolman, 1979, p.407-408), on who best knows (interprets) the dream, the expert or the dreamer. Discuss the dreamer as expert and how this comes about in a dream sharing group.

SCHEMA GROUP -FIRST SESSION

1. Give basic instructions for all groups (above) with folders full of dream log sheets. Ask for every detail that can be remembered without adding any. Suggest that rising 15 minutes or so earlier every morning will be necessary to transcribe a detailed dream experience and fill out the questionnaire.
2. Define lucid dreaming, awareness of dreaming while dreaming. Elaborate the concept and read examples from Green (1968) and LaBerge (1985). Ask for lucid dreams from subjects and correct any misconceptions.
3. Give each subject a leather bracelet to wear for the duration of the experiment. Explain that the bracelet is to serve as a cue for the rehearsal of a simple task. Whenever they catch sight of the bracelet during the course of the day, they should question their state of consciousness, waking or dreaming. They should ask themselves what causes them to feel sure of their answer. If they decide they are awake, they should fix the intention to dream lucidly that night. As they are falling asleep they should do their final rehearsal of the day.
4. Discuss the initiation of lucidity from Green (1968, Pp. 30-36). Explicate the following 'triggers' to lucidity, giving examples of each from Green.
 - emotional stress and nightmare
 - recurring dreams
 - the recognition of a dream oddity or incongruity
 - recognition of the 'dream-like' quality of the experience

- flying and falling
- out-of-body experience
- noticing the achromatic dream

5. Tell subjects to pick the two that seem most available to them personally, and to think about these as part of their task rehearsal.

6. Tell subjects to reread each dream at least once after it is transcribed, as often as they like afterward to spot places where lucidity could have been initiated.

7. Explain 'fleeting lucidity' and to be sure to record it as well as more prolonged episodes.

8. Briefly explain dream control with lucidity and without, and mention lucidity with and without control.

9. Give subjects a handout for their file folders which contains all these instructions, plus suggestions to enhance recall taken from Delaney (1979, appendix). See Attention Control group, session 2.

SCHEMA GROUP - SECOND SESSION

1. Ask subjects if they are having any difficulties with recording their dreams, answering the questions, and rehearsing the task, especially while falling asleep. Review handout suggestions on how to increase dream reporting and possibly recall such as: getting into the routine of setting time aside each morning, keeping a tape recorder by the bed, and rehearsing the dream while getting the pen and report sheets.

2. Give a brief review of the content of the previous meeting particularly regarding the triggers to lucidity. Ask for experiences they are puzzled about or wish to share.

3. Define dream control in more detail than in the previous session. Explain control over and control in the dream, and the vectors of participation, mastery, feeling expression, planning and solving.

4. a) Read from Garfield (1974, p. 112) 'Learn from Senoi dreamers' (non-lucid control).

b) Read high level control dreams from Wallin's (1977) experiment (non-lucid control).

c) Read from Chang (1963) on what Yogi dreamers can do (lucid control).

d) Read examples from LaBerge on lucid control.

5. Explain the questions (adapted from Corriere et. al. 1980,

p. 49) which are on the back of this week's dream log sheets.

- 1. At what point in the dream could I have triggered lucidity but did not do so?
- 2. a. How expressive was I in this dream?
b. How active was I in this dream?
c. In retrospect, how would I handle the dream situation(s).

6. Read over all materials for 5 minutes before bed.

SCHEMA GROUP - THIRD SESSION

1. Discuss LaBerge's signalling technique from REM sleep. Show subjects an example of this signalling as seen on the polygraph record. Fantasies from the hypnagogic period are not the same and are not what we are after.
2. Have a brief question and answer session. Briefly review cued schema rehearsal with triggers, and review basic notions of dream control.
3. Briefly describe Rossi's theory of the types of dreams that lead up to multiple levels of awareness. Discuss dream thoughts and conversations, transformations in the dreamer, multiple states, recognition of bizarreness, and multiple levels dreams, including false awakenings. Explain that this scale is on the back of this weeks dream log sheets and subjects should self-rate each dream on the dimension.
5. Read pages from Castaneda's (1981) The Eagle's Gift, from the section on 'Dreaming together'. Suggest that interested subjects may try this experiment if they wish, using mutual lucidity as the tool. Please report any attempts or success.

END

08-08-88

FIN