

Cognitive Psychology and Dream Research: Historical, Conceptual, and Epistemological Considerations

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Historical, conceptual, methodological, and epistemological factors in the development of dream research are outlined and discussed, along with four stages of dream research. Issues evolving from the analysis are examined in relation to cognitive psychology and the philosophy of science, among them disciplinary boundary problems, reductionistic approaches, the importance of dreams and dreaming as cognitive data, the concept of levels of analysis, cognitive operations, and meaning in dreams. Implications for future research are discussed.

The study of dreams and dreaming¹ is an area of research that seems either to stimulate almost boundless, yet imaginative, theories regarding the meaning and function of dreaming; or conversely, it stimulates an equally boundless and irrational skepticism, denying any meaning or function to dreaming whatsoever. On the one hand, there are those who believe certain dreams are evidence that they fly off to Jupiter and Mars in the middle of the night without physically leaving their beds, becoming kind of disembodied astronauts, as it were; and on the other hand, there are those who believe dreaming to be simply the result of the spontaneous and random firing of subcortical neurons, a kind of Fourth-of-July nocturnal fireworks of the mind.

Toward which one of these poles the evidence appears to gravitate depends upon what empirical, methodological, theoretical, and epistemological canons

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¹Before embarking further, it is important to generally define some main terms. "Dream" refers to content analysis and interpretive schemas. "Dreaming" is used here to refer to the *processes* of dreaming such as physiological events, and to *structural* aspects not directly related to meaning or interpretive schemas. The term "dream research" is used here to include both of the above terms. "Dream psychology" is used to include the work of any discipline whose research is psychological in nature and pertinent to dream research. The term "cognitive psychology" as used here is not restricted to a discipline within psychology, but as a *problem area* that can be approached from an interdisciplinary and multidisciplinary perspective. Finally, the term "research" is defined as the investigation of phenomena by means of a systematic and controlling methodology.

are adhered to. This paper, however, will not attempt to resolve these issues but will outline some related historical and epistemological problems pertaining to the study of dreams and dreaming. Some of the issues of dream research, while appearing historical, methodological and conceptual, are in fact largely epistemological in nature, pertaining to methodological approach, of disciplinary boundaries, of what constitutes valid data, and more globally, what research questions should be asked of data. In short, these issues revolve around what research parameters and findings are acceptable. Dream research seems to provoke exceptionally heated opinions around such problems and issues.

It should be pointed out at the onset, however, that these problems and issues are not unique to dream research; they are to be found throughout the physical, biological, social and behavioral sciences in one form or another (Nagel, 1961). Indeed, such problems reach into the very foundations of the philosophy of science, and have been argued persuasively from all sides within each discipline. Accordingly, there is little to be gained by a detailed replication here, either of the body of literature in this area, or the specific evidence supporting each side. At this point it is sufficient to raise and to examine some of these issues as they are manifested in dream research, although at a future time, a systematic and detailed review of the logic and evidence could prove very instructive—for nowhere else do these questions in the philosophy of science appear to loom so large as in dream research.

The research questions which this paper will examine are of cardinal importance for the framing of disciplinary boundaries and for the subsequent direction of research. Such questions should not be ignored or invalidated by *ad hominem* labeling as “just philosophical.” In a recent volume by Foulkes (1985), a volume that in many ways represents the most significant theoretical work yet produced in cognitive dream research, he says of such questions: “The ways in which psychologists have sought to avoid thinking about them, while philosophers have swarmed around them, gives us every reason to believe that they are good questions for provoking arguments, but bad ones for uncovering relevant evidence” (p. 103). The history of science is replete with this type of radical empiricist stance toward the thoughtful conceptualizing of the scientific enterprise, a stance which fails to appreciate the finer nuances and roles of an epistemologically attuned philosophy of science. The primary goal of a philosophy of science is the analysis and evaluation of research questions, not the design of empirical methodologies, or the acceptance of data that fit preconceived notions of what constitutes a valid research approach in any given area. Given this role of a philosophy of science approach, then, the empirical unproductiveness of such questioning lies neither with the questions themselves, nor with the philosophers who swarm about them, but rather with the psychologists who avoid them.

Because epistemological analysis and questioning may often lead to conclusions that do not fit accepted models of a standard methodological design, it does not follow that the conclusions, though logically valid, are pragmatically inappropriate. What often is needed in research is a "what if" attitude coupled to a methodological design to accommodate that attitude. Otherwise we end up with a reductionism of the methodological kind, which abstracts out of data only those characteristics that are amenable to the parameters of the method, resulting in a skewed set of findings which may be factual enough, but unfortunately artifactual. In this sense, facts are always somewhat artifactual. In physics, the classic experiments on the nature of light serve as an example: performed with one set of procedures, light appears to be a wave phenomenon; performed with another set of procedures, light appears to be a particle phenomenon. With these preliminary epistemological considerations in mind, let us further examine this line of inquiry.

An Historical Analysis of Dream Research

The shape of any scientific area of research is not acquired solely on the basis of its characteristics or scientific merit independent from social context, historical events, and cultural values (Mannheim, 1936). It is, therefore, not sufficient to say that dream data have not historically been incorporated into cognitive psychology because the canons of scientific research excluded the adequate control and manipulation of such data. Other extra-scientific variables influence research activity. What is to follow is an enumeration of the main reasons for dream data not being considered significant scientifically. For convenience the enumerations will be divided into historical, perceptual, conceptual, epistemological and methodological factors.

Historical Factors

The study of dreaming has never completely managed to recover from its unscientific origins, as chemistry recovered, for example, from its origins in alchemy. It is a matter of historical fact, but more importantly a matter of historical contingency, that the study of dreams and dreaming entered academic psychology by way of clinical therapeutics, conveying with it the twin attributes of the anomalous and the irrational. Indeed, Freud considered dreams to be neurotic symptoms. It seems somewhat of an historical irony that the publication of *The Interpretation of Dreams*, a monumental work in the history of psychological discovery and theorizing, a veritable tour de force lifting the study of dreams and dreaming out of their ancient roots in occult, religious, and folk symbology, should, at the same time, have doomed the study of dreams and dreaming in academic psychology. Since 1899,

academic psychology has consistently refused to consider dream data within its purview. It is a curious irony in the history of psychology and science, however, that psychologists concerned with scientific evidence should conclude on the basis of folklore, as well as Freud's ostensibly unscientific analysis, that dream data were not an appropriate phenomena for scientific research. It would seem at a minimum that the more scientific course would have been to conduct research before rendering a conclusion of this magnitude.

Perceptual Factors

Contrary to what is now known from REM research, the nocturnal dream was historically perceived to be a relatively infrequent occurrence, and therefore not a significant event. Though this perception is historically true, it is not a valid reason for rejecting dream data. The frequency of an event is not a valid index of its significance, as even a cursory reading of the history of astronomy will demonstrate, let alone the history of psychology. The rarity of an event is not necessarily a good index of its importance. In part, its importance may be inversely proportional to the frequency of its occurrence. As Werner and Kaplan (1963) point out, theoretically significant phenomena in science have often been rarely occurring phenomena. An example is optical illusions, which have proved very important in understanding normal perceptual phenomena.

A variable pointed out and developed by Foulkes (1978) is that because the dream has generally been considered a sensory and visual-pictorial phenomena it has been viewed as a "perceptual" event instead of a problem in the psychology of thinking. While this may help to explain why cognitive psychology has ignored the study of dreams and dreaming, on a broader psychological level one is still left wondering why the field of perception would not have initiated dream research. What is perhaps more perplexing is the historical fact that until very recently even imagery research in psychology did not make substantial use of dream data.

Further, the dream has generally been considered to be "irrational" and bizarre, i.e., lacking in logic and reasoning. The dream was therefore thought not to be amenable to the research frameworks in cognitive psychology. Since the discovery of REM research over twenty years ago, however, it has been widely recognized that most dreams are not bizarre, but in fact quite prosaic. However, even if dreams are "irrational" they still exist as a valid cognitive experience that theoretically could be studied, just as the "irrational" quantum phenomena are in physics. On this basis, the impossible limits of dream data are not reached, but rather it is the limits of an inadequate framework in cognitive psychology which are reached. Indeed, it is no mere analogy to say it would have been possible to have developed a cognitive "quantum

mechanics" of the dream, complete, moreover, with its own indeterminacy principle based on the recalled dream not being the dream that was dreamed, which is to say—in quantum relative terms—the very act of observing changes what is observed. In addition, a statistical matrix analysis of dream "elements" (i.e., particles) could have been devised.

As indicated above, the dream was thought to be a pathological phenomenon. This view was based largely (once again) upon unscientific reasonings. And so the dream was relegated to the area of abnormal psychology and more specifically, confined to the clinical field where all the attention it received was largely as case report studies. Since most of the clinical work with dreams was "interpretive" and not methodologically controlled, this further reinforced the view that dream data were not only unreliable but invalid as typical cognitive data.

Once again, as a result of Freud's influence it has been thought that dream processes are not sufficiently similar to waking cognitions, and therefore would have very little to say to cognitive psychology. It is known now, however, that the dream is not as different from waking thought as was once considered to be the case. Exactly what the similarities and differences are between waking and sleeping mentation remains an open research question, despite the fact that the thrust of present research is toward blurring the distinction. Happily for dream psychology, many of the similarities between dreaming and waking cognition have been pointed out (Antrobus, 1978; Foulkes, 1985; Webb and Cartwright, 1978). Regardless of the validity of this ostensible difference, dream processes are valid data in their own right. The ignoring of such data—not to mention data in the fields of poetics and aesthetics—demonstrates the limitations of cognitive psychology and not the limits of those fields.

For the most part the non-physiological study of the dream has been considered the purview of psychoanalysis (broadly construed), even though much of the so-called interpretation of dreams is not fundamentally tied in any necessary way to the essential characteristics of psychoanalytic doctrine (the precise state-characteristics of the theory, notwithstanding). I know of no consensually agreed-upon parameters that constitute the theoretical limits and defining state-characteristics of psychoanalysis. A glance at Freud's cardinal "Dream Work" chapter supports the conclusion that much of *The Interpretation of Dreams* is not in fact tied to psychoanalytic doctrine, a fact not widely understood.

Conceptual Factors

The currently established distinction between the study of "dreams" (e.g., dream interpretation, content studies, etc.), on the one hand, and the study

of "dreaming" on the other (i.e., the process of dreaming, EEG, REM studies, memory processing, etc.), has not been a clear one historically. Even when this distinction between dreams and dreaming has been clear, the "specter" of Freudian interpretation, in the minds of many researchers, has remained fused to dream research. The relating of dreaming to psychoanalysis has been a case of "guilt by association." The ensuing effect has been to retard the advance of dream research, as historically few "respectable" academic psychologists would associate themselves with such research endeavors.

The view that so-called dream interpretation is tied to psychoanalytic theory seems to result in part from the failure to make a conceptual distinction between dream *interpretation*, on the one hand, and dream *analysis* on the other. The general field of "Content Analysis" (Gerbner, Holsti, Krippendorff, Paisley, and Stone, 1969) and the specific dream content *analysis* research of Hall and Van de Castle (1966) are examples of *analysis* of dream data, as is Levi-Strauss's structural anthropology approach (see Kuper—this volume). A dream *analysis* approach would study various social psychological aspects found in dreams, such as sex role representations, cultural values, and other demographic data. A further example is the investigation of such cognitive operations as reversals and inversions as found in dreams. By and large these suggested areas of dream analysis, in contradistinction to interpretation, have interstitially been embedded in dream interpretation. Abstracted out, they would constitute an approach more amenable to academic research. If this area had been opened up historically, dream research would be more advanced than it is currently.

Historically, dream interpretation—à la Freud—has been conceptually concerned with *origins* of the dream (Foulkes, 1978), whereas cognitive psychology has tended not to be concerned with the developmental origins of specific operations, Piaget notwithstanding.

Further conceptual reasons for dream data not being incorporated into academic research are that the study of dreams has tended to take a phenomenological and holistic or molar approach whereas academic psychology has tended to function on a molecular level². The epistemology of each level notwithstanding, interdigitating a given logical level of analysis with a lower or higher order level is recurrently problematic in the history of science, hence the two fields have remained separated.

²I would like to define "phenomenal" and "phenomenological" in general terms. As I am using the terms they refer to research that is conducted upon phenomena that are within the confines of concepts occurring in common usage, for example, dream research on depression or lucid dreaming as opposed to mnemonic memory storage. I would also use the terms as Hunt (1982) does in arguing so persuasively for a phenomenological "altered states of consciousness" approach to dream research.

Epistemological Factors

In the study of dreams, clinical dream interpretation has tended to emphasize the personal meaning of dreams. In a strong definition of "personal meaning" the dream is a "message" from the non-conscious mind to the consciousness of the dreamer; in a weak definition the dream is simply a set of cognitions that reflect non-conscious feelings and concerns of the dreamer. In either case cognitive psychology has little interest in idiosyncratic personal meaning. Historically cognitive psychology has been, and remains, oriented to nomothetic data. It is possible, however, that the study of idiosyncratic dream data could inductively lead to important nomothetic findings.

Dream interpretation, with a few exceptions, has been concerned with the "hidden symbolism" of dreams. Cognitive models of mind are not adequately designed to investigate this type of symbolism. Though some non-mainstream models are appropriately designed, they too have not generally been concerned with dream data.

Along with the more molar or phenomenological/holistic approach to dreams have gone the motivational concepts of *intention* and purpose: that dream construction is motivated on some level by the dreamer; that dreams are purposeful, not just random, and thus the result of a causal sequence of information processing rules. Cognitive psychology tends more towards a "natural science" approach than what is termed the "human science" approach. As a consequence, until very recently (Antrobus, 1978; Foulkes, 1982, 1985), dream data were apparently considered inherently not amenable to information processing models of cognition.

Methodological Factors

Since Freud, it has generally been accepted that understanding the personal meaning of dreams is dependent upon the dreamer's associations. Academic psychology, however, as a reaction to introspectionism, has tended to be suspicious of evaluative, subjective reports by subjects.

Finally, but not exhaustively, because of the difference between the logical level of analysis in the study of dreams and dreaming and cognitive psychology, a difference in methodological approach has continued to exist. Cognitive psychology is experimental and quantitative. Much of dream research could (but has not yet done so) conform to this paradigm. As a consequence, research into dreams has been subject to more stringent criteria for validation. One can legitimately wonder how many findings psychology would be left with if all of its research were subject to the same severity of critique as is dream research.

The question arises: Is an experimental, quantitative approach sufficient

for dream research? Indeed, there is the larger question: Is this quantitative-experimental orientation all that cognitive psychology should aspire to? Other research methods do exist, each with its own credits and debits (as discussed further on).

The study of dreams and dreaming, it appears, has historically not been accepted into academic psychological research not because of an inherent limitation of the data itself, but rather because of the historical and epistemological reasons outlined above and others to be discussed later as this paper develops. All of these related factors, and most likely others as well, have directly and indirectly contributed to holding a cognitive analysis of dreams and dreaming at bay. Some aspects of the study of dreams and dreaming are beginning to emerge as valid research areas. As with any scientific area of research, there appears to be a process of going through successive stages of development.

Stages of Dream Research

Historically, the study of dreams and dreaming can be seen to have evolved through four idealized and general stages³. The first stage may be termed the *Ancient Stage* in which can be lumped divine, supernatural, and folk symbolism explanations. In each the "meaning" of dreams was derived by consulting oracles and by fixed-symbol dream books. This was the pre-scientific stage.

The second stage can be depicted as the *Psychoanalytic Stage*, broadly defined and ushered in of course by Freud in 1899, in which dreams were viewed naturalistically as the consequence of unconscious, disguised psychological processes carrying latent meaning. The emphasis here is upon symbolism and psychopathology. Interpretation is accomplished by the free association of the dreamer. Neo-Freudian interpretations are variations on the basic Freudian scheme. Perhaps a significant refinement of this stage might be termed the "clinical-interpretive" stage (Hunt, 1986). This stage is characterized by an emphasis on metaphorical interpretation of content (Boss, 1958; Jones, 1974; Jung, 1974; Rycroft, 1979). This stage led to a content analysis approach (Hall and Van de Castle, 1966) and can be considered the initial scientific stage of dream research.

A third stage is the *Psychophysiological Stage* of research ushered in by Aserinsky and Kleitman's almost fortuitive discovery in 1953 of REM sleep, and the later research of Dement (1976), Hobson and McCarley (1977), and a host of others. The emphasis in this stage is upon the physiological correlates of

³Any historical reconstruction is of course an ideal scheme, with identifiable forerunners. Aristotle, for example, considered dreams to be thinking during sleep, and therefore cognitive.

dreaming, dream recall, EEG readings, REM deprivation, and other physiological concomitants of the dream state. Within this stage there exists a view suggesting that dreaming is simply the result of random brainstem activity. It is the discovery of REM sleep that was primarily responsible for legitimizing what dream research now exists in academic psychology. This stage can be considered the first completely scientific study of dreaming—of the dream state per se.

It is yet another irony in the history of psychology that the second of the two most significant breakthroughs in dream research occurred in the field of sleep physiology and not psychology. Psychology, or dream psychology at least, is now trying to reestablish its claim to the field.

A fourth stage is the *Cognitive Stage* of dream research⁴. It is a complex stage that can be seen as constituted by three different branches (see Haskell, 1986a). The first branch is comprised of psychologists holding a mainstream cognitive psychology approach and an emphasis on information processing models of cognition. This approach is molecular and process oriented. The second branch treats dream data from what might be termed experimental phenomenology, taking a more "symbolic" and molar view of cognition. The third branch is an experimental clinical approach. To forestall any misunderstanding regarding the meaning of the term "symbolic" as used by mainstream cognitive psychology, the term simply (or not so simply) refers to the cognitive operation of the manipulation and transformation of information about objects when they are not physically present. "Symbolic" as used by most cognitive psychologists bears little or no resemblance to the manner in which many clinical dream researchers use the term. For the latter, symbolic refers to "disguised," "hidden," or "encoded" meaning that is represented by an object.

The cognitive approach was initiated by Neisser in his classic 1967 work which devotes considerable space to discussing and attempting to integrate dream processes into a constructivistic cognitive framework. However, it should be noted that the cognitive approach was suggested as early as 1953 by Hall. Despite these early efforts, however, this stage did not clearly begin to form until the work of Antrobus (1977, 1978), Arkin, Antrobus, and Ellman (1978), Foulkes (1978), and Webb and Cartwright's inaugural paper on dreaming in the *Annual Review of Psychology* in 1978. In terms of the experimental phenomenology approach, perhaps the work of Gackenbach and Schillig (1983), Hall (1953), Heynick (1981), Hunt (1982), Kuper (1979), LaBerge (1985),

⁴"Cognition" is a very broad term, and therefore the work of most researchers who investigate mental processes could be termed cognitive research. In this respect, certainly Freud's work could be considered cognitive. But for purposes of this brief historical analysis, it is conceptually convenient to highlight some of these works where the approach to cognition is an integral and primary focus of the work. A more detailed analysis, however, would have to take into consideration the conceptual intricacies and complexities of the term.

Moffitt, Hoffmann, Wells, Armitage, and Shearer (1985), Palombo (1978), and Rossi (1972) are the most significant. In terms of the experimental clinical approach, the work of Cartwright (1977), Fiss (1984), Hartmann (1984) and Kramer, McQuarrie, and Bonnet (1980) are particularly significant. There are, of course, a host of important, related pieces of research too numerous to mention.

From this very brief and simplified historical sketch depicting the stages of dream research, we can conclude that dream research is coming of age. But with growth comes conflict, and dream research certainly has no shortage of that. It is to some of these conflicts and controversies that this paper now turns.

Cognitive Psychology, Epistemology and Dream Research

From a Psychophysiology to a Dream Psychology

In the brief historical sketch above it was suggested that the psychophysiological study of REM sleep ushered in the current scientific study of dreams and dreaming. Indeed, the psychophysiological experimental-laboratory approach provided the needed mark of legitimacy for the current post psychoanalytic resurgence of dream research in many fields. However, its imprimatur for the study of *dreams* (i.e., "interpretive" schemes relating to dream content) as opposed to *dreaming* (i.e., dreams as a psycho-cognitive and physiological *process*) was quite indirect and oblique, and in point of fact is based more on the "band wagon" effect than on any substantial research findings on dream content. Granted, early REM research did seem to promise such assistance. Of course, it is possible that psychophysiological research may yet add to our phenomenological understanding of dreams and dreaming (see Moffitt et al., 1985).

Akin to those in the social and behavioral sciences who have seen in quantum physics' *Principle of Indeterminacy* support for the free will doctrine, many clinicians and other students of dreams have operated on the inference that REM research has demonstrated the psychological importance of dreams, when in fact it has not. Dream research has not even clearly demonstrated the relevance of dreaming as a physiological process, although it surely seems that there must be one. Nevertheless, in the minds of all but the most ardent of dream researchers, REM research has been viewed as scientific support for the study of dreams. That perception, however, has been enough to spur the current surge in all facets of dream research.

The psychophysiological revolution in the study of *dreams*, however, has not occurred. But this is not to say there have been no benefits. There have

been. Dream *psychology* is indebted to dream *physiology*; for example, it is now known that we dream every night, as well as approximately how much time we spend in dreaming sleep. But most of the benefits seem to have been on the side of sleep disorder research. According to Foulkes (1985), most of the benefits from dream physiology for dream psychology have already occurred. So where does this leave the study of dreams and dreaming? It leaves dream psychology right where most dream researchers always thought it was (but in fact did not really know in a scientific sense): in the middle of the social and behavioral sciences, and more specifically for purposes of this paper, in cognitive psychology.

It is David Foulkes (1985) at the Georgia Mental Health Institute and Emory University who has contributed systematically and cogently reasoned arguments for a cognitive psychology of dreaming. A skilled laboratory researcher and theorist, Foulkes, more than any other dream researcher, using data from mainstream research, has put cognitive psychologists on notice: not only is dreaming valid cognitive data, but more importantly, dream research is a body of data that cognitive psychology can no longer afford to totally exclude, let alone not to incorporate into the mainstream cognitive models. But as will be discussed later, this potential success may have its negative side as well.

Neisser (1967) appears to be the only major cognitive theorist who sees beyond the obvious pitfalls of the psychoanalytic edifice in considering Freud a cognitive theorist. Foulkes (1978) too, though not a cognitive psychologist by his own admission (but who, I claim, should be considered as such), persuasively argues that Freud is a major figure in the history of cognitive psychology. A glance at the index of Freud's *Interpretation of Dreams* demonstrates the inclusion of many cognitive functions: language, imagery, transpositions, temporal relations, symbols, perceptions, constancy phenomenon, transformation, representations, apparitions, inversions, association, calculation, logical relations, problem solving, etc. Granted, Freud did not study these areas with the clarity and perspective available to present day researchers. Nevertheless, when reading Freud's major work one is certainly struck by his struggle to understand cognitive operations.

The Cognitive and Epistemological Importance of Dream Data

The question most cognitive psychologists might ask is "Why should cognitive psychology be concerned with dream data?" The most obvious, but apparently unthought of answer is "because it exists." But over and above this seemingly facile, and in fact valid response, there are additional reasons. Based upon a cognitive psychological mnemonic model of information pro-

cessing, which Foulkes (1985) adapts and applies to laboratory dream data, Foulkes concludes that it is:

Precisely because the unconscious mnemonic cues for "episodic recollection" in dreaming are so varied, the dream is our best demonstration of the constructive nature of conscious recollection and our best illustration of how mnemonic information suitable for processing in different modalities simultaneously may be processed and sensibly may be integrated in conscious experience. (1985, p. 182)

In this regard, Antrobus (1978), based on his own and other experimental sleep research, similarly states:

There is good reason to expect that the examination of dreaming and sleep mentation might contribute significantly to cognitive psychology. In the first place, any comprehensive model of thought and imagery must be able to account for how sleep mentation is produced. Secondly, the distinction between waking and sleeping mentation and, indeed among sleep mentation of different sleep states, provides a naturally occurring method for isolating different qualities of thought and imagery that is simply not available in the waking state. (p. 569)

Hunt (1985), a phenomenologically oriented dream researcher, also maintains a similar stance. He states that

. . . dreaming frames itself for inspection in a way that waking consciousness does not and so forces upon us the reach and range of material that a genuine cognitive psychology must address. (p. 7)

The common point linking these three researchers is clear: the studies of cognitive operations found in the various dream states are important data. The implications are considerable. As Antrobus (1978), Haskell (1982) and others have stated, it would certainly seem that any adequate model of cognition should be capable of explaining both normal and anomalous data, either by a general theory that includes both or by integral linkages that tie the two together.

The cardinal implication of the passages quoted above is an epistemological one. Throughout the history of the study of dreams and dreaming, there have been those researchers who have seen in the dream the potential for the recognition of knowledge or information not apparently available to waking thought. One of course is reminded here of dream theories in preliterate cultures, of the aboriginal concept of "The Dream Time" in which the world was created. In addition, in a footnote included in 1914, Freud (1961) says of the mystic DuPrel, demonstrating the high regard in which he held DuPrel, that he [DuPrel] was "one of the few authors for whose neglect in earlier editions of this book I should wish to express my regret" (p. 63). Freud reiterates DuPrel's view that *the gateway to metaphysics lies not in waking thought but in*

the dream. While numerous other theorists have envisioned and attributed to sleeping mentation such philosophical and cognitive aspirations, and indeed numerous other mental encounters of a more extraterrestrial kind—cognitive psychologists have (somewhat justifiably) not been overly interested in running to their laboratories to design experiments to test such hypotheses.

Putting aside the more extravagant claims that have been made on behalf of the dream, it is now possible within the language and models of mainstream cognitive psychology to suggest that dream data may hold the potential for initiating an epistemological paradigm shift in the Kuhnian sense of a scientific revolution. This claim is not made lightly, though admittedly, it is made on what some may consider premature grounds. Be that as it may, in order to accommodate the peculiarities of “anomalous” cognitive operations and the apparently constructive views that dream data provide, the potential exists to force, if not a cardinal paradigm shift, then at least a significant ordinal shift in conceptualizing the operations of the mind in both the sleeping and waking state.

If the suggestions of Antrobus, Hunt, and Foulkes in the quotations above are valid conclusions, and if they are an index of what Foulkes has tentatively shown in his latest works, then indeed there may well be an incipient revolution in progress within cognitive psychology, provided the processes found in dream data are not shaved and subjected to a reductionism in order to fit existing conceptualizations. At this point it should be noted that while Foulkes would most likely not assent to many of the following implications being drawn from his work, the implications are logically there.

According to Foulkes (1985) there is only one “dream” *production* system—not different systems for different physiological sleep states (p. 76). The term “dream” is deliberately placed in quotation marks here as Foulkes maintains that “dreaming,” under certain conditions, can occur while awake, apparently when cognitive structuring from the external world makes minimal demands upon attention—or, it might be added, when internal mental operations are preventing external processing, as appears to be the case with some forms of schizophrenic hallucinations. When minimal external stimulation occurs, along with diffuse mnemonic activation (the activation of primary memory units from storage—not to be confused with veridical memory), what is termed “dreaming” occurs.

While dreaming is memory-based, according to Foulkes (1985), it is not remembering in the phenomenological sense (p. 28); its function is not to generate an analog copy of the world as we phenomenally experience it in dream images. A great deal of constructive cognitive work has been performed prior to the phenomenal dream as we know it; multiple operations of some sort have been carried out before we experience imagery. According to Foulkes

Image reconstruction would depend on the acquisition of abstract depictive knowledge in the first place and then the ability to process that knowledge back into imaginal "copies" of perceptual phenomena. That is, both processes of mental analysis and of synthesis are required. There is deconstruction and reconstruction. (1985, p. 158)

From this level of analysis the processes involved in dreaming are not the result of an analog process, although they presumably function (by analogy to information theory) with bits of information ("bits" carry no meaning themselves) that are stored and retrieved according to binary rules. Such a view is actually as elegant as it is simple-minded. But contrary to those who harbor "existential" objections to such a view of the mind, the term "simple-minded" is not meant derogatorily. How else might a finite amount of brain tissue store and process such vast amounts of phenomenal data so efficiently?

The problem with those holding this digital view concerns their reductionistic tendency to collapse all cognitive processing into one, albeit perhaps fundamental, level of analysis. Epistemologically, Foulkes (1983) suggests:

If dreaming has any critical role to play in the larger fabric of our lives that role must be in relation to the synchronously appearing phenomena of self consciousness and symbolic meta processing. (p. 331)

If dreaming functions as Foulkes suggests, based on his adaptation of cognitive models of memory storage and retrieval, then we can actually witness the various stages of constructive cognitive operations. Further, if, as Foulkes (1983) speculates, "dreaming may be a medium through which knowledge at the level of motor memory and recognition becomes recoded and interrelated as conscious self knowledge" (p. 335), then research into dreaming may become a window into the origins and constructive development of thought (Haskell 1986a, 1986b, 1986c). Enter epistemology.

It is thus reasonable to conclude that cognitive findings in dream research may foretell two possible paradigm shifts in cognitive psychology: a major shift with far-reaching epistemological implications, and/or a minor shift with lesser but nevertheless important implications. The latter shift will be considered first. Epistemology, as the study of how we come to know what we think we know, would certainly figure in cognitive discoveries regarding the very constructive processes of thought. If, indeed, it turns out that the various states of dreaming exhibit, along a developmental continuum, the various stages of cognitive development, each with their own relatively unique operations, then the early cognitive operations involved in how we know what we think we know become visible for further inspection and research. One possible research design would be to program subjects through a presleep set of stimuli, or through conditioning procedures, and then inspect the cognitive operations of the dream to ascertain how the specific presleep stimuli are con-

structively processed. Certainly this kind of research is fraught with problems that would need to be worked out. While it would seem that only the processes of *construction* would be available, it is possible that deconstructive processes might also be indirectly evident.

Whatever the case may be, a minor or ordinal paradigm shift *could* occur—in that cognitive psychology would be researching non-conscious processes from a perspective different than it currently has held when on those rare occasions it has investigated non-conscious cognition (see for example, Marcel 1983a, 1983b). Moreover, an understanding of the constructive origins of conscious thought would probably demand revisions of current research findings. Such a shift could move mainstream models closer to the experimental phenomenology approach, and vice versa. If this shift occurred, it would seem to follow that non-dream cognitive research would perhaps shift in the direction of what has been referred to as “The New Look” (Erdelyi, 1974), and, more broadly, as the “Third Force” (Haskell, 1986a)—as exemplified in the works of Bowers and Meichenbaum (1984), Bruner and Postman (1949), Deutsch and Deutsch (1963), Dixon (1981), Hilgard (1977), Nisbett and Wilson (1977), Norman (1976), Shevrin and Dickman (1980), Spence and Bressler (1962), and others. The essential methodological characteristic of the Third Force in cognitive psychology is its molar, experimental approach to the study of dreams. The approach focuses on non-conscious cognitive processing. Representing this Third Force is Cartwright’s (1984) pioneering, experimental work on dreaming and depression.

A major epistemological shift could occur if certain cognitive operations found in dream data are not shaved to fit existing cognitive frameworks. It seems reasonable to suspect, based both on Foulkes’s (1985) thesis and long-standing phenomenological findings (see Werner and Kaplan, 1963), that developmentally basic, rudimentary, and (perhaps) non-linear thought processes found in the dream may utilize quite different operations than developmentally mature thought; or at the very least, they may serve as precursors to conscious, logical thought. In either case, granting the eroding distinction between waking and dreaming cognition, such findings would force a significant shift in current perspectives. In addition, if the findings of some researchers in the Third Force (see Dixon, 1981, for a compendium of such findings) are correct, there appears to exist not only a non-conscious processing of “thought elements” on their constructive way to a complete thought on the conscious level, but a complete cognitive (thinking) process on a non-conscious level equal to and superior in some respects to conscious thought, a kind of “hidden self,” or “hidden observer,” as Hilgard (1977) metaphorically contends. Thus, there may indeed be a distinct and separate fully-functioning cognitive system; this system may be operational in the dream state (Haskell, 1985a, 1985b).

If these considerations turn out to be correct, then dream research might be instrumental in bringing about a major epistemological shift in cognitive psychology. The current conscious, linear, "rational," logical model of mind would have to undergo fundamental revisions. This conclusion admittedly assumes a model that is open to change. The Third Force has now existed for several decades, and yet there are few signs of its influence on mainstream cognitive psychology. It may be that the mainstream will fail to change, but that the growing Third Force will itself become mainstream on its own. As Kuhn (1962) has pointed out, in science, old paradigms seldom die, they just fade away. So, should dream psychology join the mainstream model of cognition?

To Be Or Not To Be—Mainstream: Is That the Question?

The Controversy

A heated controversy within dream psychology is whether or not it should adapt itself to the self-defined and self-proclaimed rigor or mainstream models of cognitive psychology. While there are some who would respond with a definite "no," the answer is in fact not as self-evident as is the issue. For those holding this view, the only rigor likely to be gained is of the "mortis" type; conversely, as those who unthinkingly answer "yes" believe, if dream research does not adapt itself to mainstream cognitive models, it may be just as well if it does end up a corpse.

Perhaps the strongest proponent (at least in print) undertaking the view that dream psychology should adapt itself to the mainstream model of cognitive psychology is Foulkes. In his latest book Foulkes (1985) argues persuasively, given his premises, that

If dream psychology is to become an integral part of cognitive psychology it can not afford to strike out on its own, at just the point where its interests most closely intersect with those of the rest of cognitive psychology. (p. 158)

The first issue is obvious enough: "dream psychology is to become an integral part of cognitive psychology." The question is, however, of what branch of cognitive psychology is dream psychology to become an integral part? For Foulkes, the answer is mainstream cognitive psychology. There are many theorists who would respond to his call were Foulkes to broaden his perception of what constitutes cognitive research.

Foulkes's second point is that dream psychology "can not afford to strike out on its own," from (mainstream) cognitive psychology. But it might be asked, since when has dream psychology *ever* been a part of cognitive

psychology? A third point involves two assumptions embedded in this presumed and unsanctified relationship. The first assumption appears to be that without mainstream cognitive psychology dream psychology will flounder and return to whence it came—namely, into the hands of those untutored in systematic research: back into the inner recesses of psychoanalysis. The second assumption seems to be that without the imprimatur of mainstream models, dream research will not gain the mark of legitimacy it (in fact?) needs. Both assumptions, though possessing a great deal of truth, are ultimately false. The dream research die has been cast, and it is not one possessing a singular mold.

The fourth point of Foulkes's statement is that "the interests of dream psychology most closely intersect with those of the rest of cognitive psychology." But it should be asked, by what set of criteria, by what authority, and to whom has the mission been given, to determine the interests of the broad field of dream research?

Dreams and Meaning

It may be true that psychoanalytic and psychophysiological dream research have both run their course—significant courses at that, leaving several vacuums in dream research. What is obviously needed are systematic research frameworks. Two such incipient frameworks have been offered by Foulkes: one modeled on psycholinguistics, and another, broader framework modeled on an information processing paradigm. Both are potentially powerful explanatory tools, but not all-powerful. These models do not speak to many cardinal areas of dream research. Nevertheless, Foulkes (1985) maintains that with these models

We don't need to run to psychiatrists to find out how we think or speak; neither do we need to consult them about how we dream. *There are no privileged observations that lay outside it. In each case the territory is cognitive psychology.* (p. 162) [italics added]

What is there to say in the face of such disciplinary arrogance and ecumenical single mindedness, except to wonder how a mind like Foulkes's could believe this proposition⁵. Yet, one is reminded that the history of science and religion

⁵It is not without considerable reservations that I make critical reference to Foulkes's works. The reason I do, however, is that he has written so clearly and systematically on these issues from a singular scientific and epistemological approach which he applies with compelling skill and acumen. Foulkes has become a kind of spokesperson for a mainstream approach to cognitive research as it applies to the study of dreaming. To date, there is no single, systematically obverse equivalent to Foulkes's work. I want to make clear that while I do not agree with his reductionistic position, I consider my critical use here of his statements a tribute to his work. Unlike many others in dream research, it seems clear to me that it is by the very nature of his restricted and narrow view of dream data, and by his careful reasoning and research, that he has in fact been a successful dream spokesperson to those outside the field who would otherwise continue to ignore dream data. As is being argued here, it is not the restricted approach to dream data that is invalid but instead the reduction of all dream data to that approach.

are strewn with such fervent adherences to reductionistic doctrines⁶.

An information processing model, as currently constituted in cognitive psychology, is concerned with the *process* of thought, not its content and meaning structures. Likewise, the classic model of structural linguistics that Foulkes adapts is concerned with the forms (processes) of language and not with content or meaning (semantics) of linguistic productions. Meaning and motivation are not dealt with. Contrary to the view of some in dream research, these are important and useful models to further the understanding of *dreaming* and cognition. They are, however, not the only models; as constituted, they do not appear to apply to the study of *dreams*, i.e., content. But this methodological deficit is an insufficient reason for neglecting research into dream content. Once again, Foulkes (1985) says:

We more than have our hands full trying to deal with processing so we needn't take on the onerous chore of characterizing precisely what it is that's being processed. (p. 158)

The first point concerns who is referenced by the pontifical "We?"—dream researchers in general, or by identification, Foulkes and other cognitive psychologists? Either way, the implications are, first, that *processing* is of primary importance, having priority over *content* and *meaning*; and second, that the task of analyzing the process of *processing* is of such a magnitude that it is going to require every existing available pair of hands and energy, so that there can be no time left for anything other than the study of *processing*. Logically, the equivalent of saying we in dream research have our hands full with researching processing, so that we cannot deal with content, is the same as saying that we in cognitive psychology have our hands full with researching memory storage and retrieval so that we do not have the time to study problem solving.

As indicated in the above outline of the historical problems in the development of dream research, a great deal of the resistance in academic psychology to the study of dreams and dreaming was not based on real problems but on biased perceptions. It now appears, and from within its own ranks, that while the study of dreaming is acceptable, the study of dreams is not. Old but extant biases seem clear, as indicated by the rhetoric: "We don't need to run to psychiatrists," and we need not take on the "onerous chore." Such

⁶Despite Foulkes's insistence that dream research fuses itself to the current mainstream model of information processing, in all fairness it should be pointed out that Foulkes (1985) does suggest dream research "... might actually contribute to making better models of symbolic memory. That is, there are good reasons why memory psychology might want to pay attention to dreams" (p. 159). In other words, Foulkes does consider dream data as altering current conceptions of how memory works. So the reductionism is not as complete as some would like to impute to Foulkes. But for all practical purposes the attribution of reductionism appears valid, at least from Foulkes's recent works.

rhetoric speaks clearly. It is clear that considerations other than scientific are operating in the anterooms of dream research. It evidently remains a fear that if the door to dream "content" research is opened then all manner of Freudian specters will be let loose in the cognitive laboratories. Apparently, dream research has its own irrational version of the Domino Theory.

The battle of the biases is, however, not one-sided. There are many who see dream researchers like Foulkes in the shape of a Trojan Horse carrying the enemy into the home camp and who thus fear the fall of their ideal City of Dreams. There is good reason to believe, however, that defeat will not be forthcoming for some of the very same reasons that psychophysiological research appears not only to have finally reached a dead end, but in fact to have been headed inevitably toward that end: just as no physiological or neuronal research is ever likely to completely explain events occurring on the psychological level, models of information processing in current use by mainstream cognitive psychology are not likely to explain "intention" and "purpose" related to dream content. This is an old problem in the philosophy of science, the problem of different levels of analysis.

Level of Analysis and Dream Research

Much of the controversy in dream research seems to result from a lack of awareness regarding levels of analysis in scientific research. This problem bears directly on the above issue of whether dream psychology should or should not be reduced to the parameters of mainstream cognitive models. The latter analyzes human cognition from a physical and natural science framework where there exists no need to impute motivation to an electron, or an *elan vital* to a cell. Certainly, human behavior can be analyzed in the same mechanistic manner, and quite usefully for some purposes.

Language and Meaning

In his cognitive-psychological model of dream production, Foulkes (1982) proposes a field of study to be called "psychoneirics," which he defines as "the cognitive-psychological study of the processes of dreaming, and which is meant to stand in relation to dream phenomena as psycholinguistics does to linguistic phenomena" (p. 170). This means that, just as in structural linguistics, it is the form (syntax) of dreaming and not its meaning (semantics) that is important. According to Foulkes (1985), dreams do not have semantic-intention but only syntactic-intentionality; that is, the "intent to say whatever is said in a well-formed fashion" (p. 166). According to this view, dreaming "is the imposition of formal (syntactic) organization on mnemonic activation, which is itself too diffuse and ill-organized to have expressive or thematic (seman-

tic) coherence" (p. 166). Foulkes goes on to say, "the reason why dreamers can't understand what their dreams mean and why we have such difficulty in reconstructing adequate accounts of what they might have meant, is that they didn't mean anything" (p. 165). A number of points are pertinent here: first, it is not at all clear, other than being an "onerous chore," why the analogy from linguistics is a selective one; that is to say, why is only syntactics (structural linguistics) and not semantics selected to model dream data. Second, it is equally unclear why dreaming would have an "intent to 'say' whatever is 'said' in a well-formed fashion." Why would dreaming have the "intention" of fitting meaninglessness into a meaningful structure? Presumably, it could be argued that the syntactic generator during sleep is fooled into thinking that the content, as in waking, is meaningful. This is, of course, a possibility. But then, Foulkes goes to considerable lengths to suggest that there is little difference between waking and sleeping cognitive operations, so if there is little difference here, why would the syntactic generator be fooled during sleep? Certainly in terms of general linguistics, sentences are given to well-formedness (syntactics) so that content (semantics) can make sense. It would seem reasonable at least to hold open the possibility that dream content has syntactic intentionality so that its content can make sense, just as in everyday speech production.

Third, if dreaming is the symbolic representation of physical objects and events, as Foulkes suggests, one is left wondering why feelings, wishes, hopes, fears, and problems are not likewise represented, and fit into syntactic units as they are in the waking expression of a spoken sentence. Certainly, Heynick (1985) has shown that most linguistic productions in dreams are not semantically meaningless with only well-formed structure of the sort linguists are so fond of creating, to wit: "little green lights sleep furiously down the hill." Granted, "meaning" is a difficult concept, perhaps never to be delimited *precisely* but only probabilistically. But this does not necessarily render its study unscientific.

It will be recalled that it was in the psychophysiological stage of research that dreaming was viewed as the consequence of subcortical neuronal firing which ostensibly activates multiple areas of the cortex. When thus activated, the imaginal experience of dreaming occurs. The neuronal firing is thought by many to be a *random* process. It is concluded from this that dreaming as it is phenomenally experienced is therefore random. It follows from this view that dreaming can have no psychological meaning, since the imaging is randomly generated. In terms of logical levels of analysis, two non-sequiturs appear to be evident here: first, the concept of randomness is not—as is widely believed—an absolute concept, but a relative one. Analyzing data as well as logical propositions from the field of physics, Nagel (1961), in his classic work *The Structure of Science*, concludes that, logically, there is only a *relative randomness*

. . . according to which a sequence of events is a random or a disordered sequence, if the events occur in an order that cannot be deduced from any law belonging to some specified class of laws. . . . Events of a certain type may be random relative to one class of laws, their occurrence may not be random relative to some other class of laws. (p. 334)

From Nagel's analysis issue a number of significant points that are pertinent to dream research.

Second, from the point of view of relative randomness, it does not logically follow that because REM dreaming may be generated by random pontine activity, that dreaming on the psychological level of analysis is also random. Classes of cognitive law may be operating other than neurophysiological ones. The Activation-Synthesis Hypothesis (A.S.H.) (Hobson and McCarley, 1977) logically implies—though it is seldom suggested that it does—that pontine random activity is somehow psychologically synthesized. Unfortunately, the right-hand side of the A.S.H. equation is not pursued. It does seem reasonable to suggest that *random activity is rendered orderly on the cortical level by the same sort of selective perception mechanisms which operate in waking consciousness*. In short, from an inherently-disordered array of stimuli only certain stimuli are selected for processing or imaging. Further, just as the selection process in the waking state is rule-governed, so too the selection rules or psychological-sets during dreaming are constituted by concerns, needs, wishes, desires, problems, etc.

These cognitive-motivational predispositions, translated into Nagel's terms, function as a different "class of laws" which, while not pertaining directly to the generation of subcortical stimuli themselves, perhaps order the otherwise random array of stimuli. Hence, the synthesis of otherwise random stimuli may result in imaging sequences that directly relate to the selection rules and therefore become meaningful cognitive events. Dreams, then, may indeed be personally meaningful, nocturnal thought processes.

Just as Foulkes suggests that *syntactic rules* function during REM sleep, so too, it is possible that *semantic or meaning-selector rules* also function. If this is a valid assumption, then the ad hoc postulate that the syntactic regulator is fooled during sleep into believing that what is being ordered is meaningful (when it is really random) need not be invoked. In fact, it seems more reasonable to invoke and extend the continuity-hypothesis between waking and dreaming to its logical conclusion: that the same general cognitive operations function during certain stages of sleep as they function in the waking state—the basic difference being that thoughts and stimuli ordered during the waking state are, by social consensus, considered to be real, while those ordered during the sleep state are considered to be imaginal. It is doubtful, however, if neurocognitive processes, or brain tissue, make this rather fine distinction. The brain probably attempts to render all stimuli meaningful.

The conclusion that dreaming is random imaging is an inferential conclusion of doubtful logical validity: even if it is granted that the premise of random cortical stimulation by the pontine activity is true, the conclusion may still be false. To transfer conclusions based on one level of analysis onto another level of analysis, while pragmatically a valid inferential operation, is logically and empirically one that should not be done without taking into consideration pre-existing information on the level to which the inference is being applied⁷.

To research dreams and dreaming as if they have no meaning is a legitimate level of analysis. But, to then turn around and use findings obtained with methodologies designed to frame data in a set of procedures that preclude meaning as evidence that dreams do not have meaning is neither methodologically nor logically sound. The same critique can in principle be applied to Crick and Mitchison's (1983) theory that the function of REM sleep is to erase or unlearn certain superfluous, harmful, or parasitic information from overloaded neural nets. Since their theory is largely based on simulated associative nets, it is a micro level theory relative to a cognitive-phenomenological level. For the purposes of argument, even if their data-premises are valid, the micro erasing or unlearning may have no appreciative effects on macro level memorial processes, just as quantum processes have little effect for Newtonian mechanics. Therefore, we probably need not worry about the negative effects of remembering our dreams, as Crick and Mitchison's theory suggests.

"Anomalous" Cognitive Operations

It has been suggested here that dream cognition may reveal cognitive operations not typically found in waking cognition, for example, reversals. Instead of researching reversals on the level of motivated phenomena, Foulkes considers them on the level of lawful linguistic mechanics in the same way that linguistics has demonstrated the lawful but *ostensibly* non-motivated slips of the tongue. Foulkes (1985) states

. . . there is no justification for assuming that those peculiarities must be dictated by deep, hidden motives of the Freudian sort. In the study of slips of speech (so called Freudian slips) it has been demonstrated that puzzling outputs of symbolic processing can be

⁷It is good for one's sense of scientific humility to understand that no matter how well one's model of a phenomenon fits both the directly observed and indirectly observed empirical data, and no matter how well it predicts phenomena, it still may not reflect the reality of the phenomena being modeled. That this is no mere philosophical skepticism, one only has to recall the Ptolemaic model of the earth-centered universe. That model fit all the facts and predicted planetary action quite well (as well as the succeeding Copernican model); but as we now know, it was not a valid model, merely a reliable one.

understood as lawful occurrences in a standard cognitive system. . . . When that demonstration is repeated for dreaming, dreaming will finally establish itself as a legitimate object of cognitive psychological study. (p. 162)

A number of points issue from this passage that are of interest to the present discussion both in terms of level of analysis and the practice of dream research in relation to cognitive psychology.

First, being quite familiar with the linguistic research on slips of the tongue or speech-errors, I accept that indeed linguistics may have succeeded in demonstrating the lawful mechanics of speech errors. Second, however, it does not logically follow that there is no justification for such phenomena being viewed as non-motivational. The abundance of psychoanalytic findings notwithstanding, there is methodologically controlled research (Dixon, 1981; Haskell 1982, 1983, 1984; Shevrin and Dickman, 1980; Spence and Bressler, 1962) suggesting that motivational structures underlie similar types of phenomena both in terms of its production and its mechanics.

Third, to lump and to label all non-conscious processing as "deep hidden motives of the Freudian sort," while a common enough conception, is not in keeping with cognitive and neurocognitive evidence (Bowers and Meichenbaum, 1984; Dixon, 1981; Hilgard, 1977; Kihlstrom, 1984).

Fourth, it does not logically follow, as the linguistic research on so-called speech errors is so fond of concluding, that because lawful mechanisms explaining the functions of errors have been delineated, motivational (conscious or non-conscious) factors are thereby either ruled out or considered excess baggage⁸. Even though a neuro-muscular level of analysis can explain how John McEnroe returns a tennis serve, it does not explain the cognitive-motivational processes involved in that act. In short, it explains the *how* but not the *why*. Surely, only a lunatic would deny that John McEnroe is functioning solely on the level of a neuro-muscular automation. The entire argument seems to assume that lawfulness precludes meaning. The implication is that meaning is non-lawful. This is a most peculiar logic indeed.

Likewise, it would be equally lacking in reason to claim, for other than purposes of analytical convenience, that the sentences generated by a speaker have no meaning-motivated basis. Thus, by the same logic (although admittedly it does not necessarily follow), just as it seems premature to claim that speech errors have no meaning-motivated basis, so it seems premature to claim that dreams have no meaning-motivated base. The charge will undoubtedly be made at this point that the preceding logic is fallacious on the grounds

⁸This is not to say that no speech errors are in fact "errors" or accidents. That there is, however, a class of so-called speech errors that are motivated seems highly probable, and that this class of motivated speech errors is made possible by the same linguistic mechanisms as non-motivated ones.

that it is adding apples and oranges, and therefore, the structure of my reasoning here violates the very logic it purports to explain, i.e., levels of analysis. It could thus be claimed that speech errors and dreams, on the one hand (apples), and the generation of normal sentences and John McEnroe hitting tennis balls on the other hand (oranges), are not the same level of analysis, because the former are considered deviant or anomalous phenomena, whereas the latter are considered standard.

To see this argument as a confusion of levels of analysis would involve two assumptions: first, that speech errors and dreaming are anomalous; and second, that being anomalous they somehow function by a significantly different set of rules or operations than non-anomalous phenomena. A precise definition of the term anomalous notwithstanding, these two assumptions (being assumptions) occur prior to research findings, and therefore are not empirically well-grounded. Well-grounded or not, they accordingly shape not only the research design by which they will be investigated, but the interpretive conclusion issuing from that research. Such anomalous phenomena can just as reasonably be seen simply as atypical phenomena that render visible the same processes operating in so-called normal phenomena (see footnote 2). From the history of the cognitive dream research it appears that reframing dream processes into waking-cognitive models instead of viewing dreaming as anomalous has indeed been productive (à la Foulkes [1985] and Antrobus [1978]). Apparently, at least in large measure, the same or similar cognitive operations function in dreaming as when we are awake. Simply because lawfulness or grammatical rules are found in the normal generation of speech, it is not claimed that speech has no meaning-motivated base. Why is such a claim made for dreams and for so-called anomalous data?

The final point by Foulkes is that only when dream data have been demonstrated to be lawful and non-motivated (as linguists claim speech errors to be) will research on dreaming "finally establish itself as a legitimate object of cognitive psychological study" (p. 162). While from the present point of view, there are no objections to this level of analysis, and no reservations about its productiveness, the question still lingers: why only then? From an early reading of the history of behavioral science the answer seems clear: because the non-motivated, meaning-based model of the physical and natural sciences is thought to be the only legitimate model of doing science. A mainstream model of dreams and dreaming, like mainstream cognitive psychology, is apparently only dedicated to a *how-model* and not to a *why-model*. Such a model appears equally dedicated to the denial of the validity of motivated, meaning-based models—Freudian, phenomenological, structuralist, or otherwise. There are those, however, on the opposite side of the epistemological line, who are just as adamant in their claim that only motivated, meaning-based models are

valid. And so the historical and epistemological controversies continue.

While limitations of space prevent a detailed explanation of meaning-motivated models of cognition, it should be pointed out here that such models do exist—and they need to be systematically integrated and applied to dream data. These models are exemplified in the works of Bruner and Postman (1949), Dixon (1981), Erdelyi (1974), Haskell (1986a, 1986b), Kihlstrom (1984), Marcel (1983a), Palombo (1978), Shevrin and Dickman (1980), Silverman and Weinberger (1985), Spence and Bressler (1962), and others. An integration and application of such models to dreaming will more than likely generate significant new controlling methodologies and frameworks for so-called dream interpretation. In fact, the term interpretation will probably go the way of *ether* in physics and *phlogisten* in chemistry, yielding to a more precise cognitive analysis of dreams.

Conclusion

A number of significant biases and issues extant in relation to dream research have been directly and indirectly raised and examined in this paper. Some of them are clearly implicit in the forgoing discussion and they remain unresolved. These issues revolve around (a) historical, extra-scientific biases and misperceptions about dream data; (b) the importance of dream data epistemologically and cognitively; (c) disciplinary boundaries and identity; (d) the direction that dream research should take; (e) reductionistic approaches to dream data; (f) what constitutes an appropriate methodology; (g) what constitutes data; and (h) what are the appropriate levels of analysis.

Having raised and examined both old and new issues, what can now be conjectured concerning the future of dream research? *First*, most of the biases and misperceptions outlined in the historical section of this paper do not seem to have changed, at least in the minds of most researchers doing “normal science” (see Kuhn, 1962).

In any event, judging from both past and current responses, dream researchers, especially those outside the mainstream model, would do well not to wait for invitations from cognitive psychology to join its ranks. Old biases do not evaporate as quickly as do some dreams upon awakening. The study of dreams and dreaming has not been overwhelmingly recognized, let alone accepted in cognitive psychology. In a compendium of experimental research, Antrobus (1978), a pioneer in cognitive dream research, noted that “the study of dreaming and related sleep mentation has been largely untouched by the renaissance of cognitive psychology over the past quarter century” (p. 569).

Mainstream cognitive psychology is not likely in the near future to induct Sigmund Freud into its Hall of Fame; nor is it likely to give any Oscars to Foulkes or Antrobus and others, no matter how deserving; nor, moreover,

are those outside the mainstream approach likely to even receive honorable mention. The specter of Freudianesque dream interpretation, reflexively associated with the word "dream" by way of a Pavlovian historical conditioning process, still looms large, and is not likely to be easily extinguished. With Promethean efforts, dream data *might* end up in mainstream cognitive laboratories. But in all probability, such data would be highly abstracted, distilled to fit the ruling paradigm. Even so, we would learn a great deal from such research about dream cognition.

Second, dream research needs to develop methodologies (with the emphasis on the plural), both qualitative and quantitative, that are congruent with the aspects of dream data being researched, just as there are different methodologies within the various sciences: subatomic research in physics is not conducted using Newtonian mechanics.

Third, given the existence of multiple methodologies, dream psychology should not aspire to be exclusively incorporated into the (currently) reductionistic cognitive psychology that tends toward a molecular level of analysis.

Fourth, it would seem to follow from the above that dream psychology should not become a discipline at all, in the sense of a discipline confining itself to a single level of analysis, but instead should frame itself as an interdisciplinary subject area with its object of research being dreams and dreaming. With this approach professional identity is attached more to the object of research than to a given discipline or method, with the method to be determined by the level of analysis of the data being researched.

Fifth, given the above, the current split in dream research between laboratory research and applied or clinical research would no longer be appropriate. The conducting of research would be paramount, whether on the molar or molecular level of analysis, and the search for articulated linkages between those levels would prevent the artifactual reduction of one level to the other. Each level would have its own uses.

Sixth, if the internal conflicts of a field of research, especially dream research, cannot be managed, then there is little hope for acceptance by others outside the field.

Seventh, there is little doubt but that dream research is here to stay. At this point the impetus provided dream psychology by the psychophysiological study of sleep appears to have served its purpose and in fact to have peaked; dream psychology can no longer depend on the benefits accrued from that field, and will now have to demonstrate the significance of dream research on its own. In addition, the historical impetus provided by orthodox psychoanalysis has long since been depleted, and in fact, is often a burden. But this is not to say that dream psychology cannot yet glean something from both fields on its way to its own identity.

Eighth, a glance at the research literature clearly shows that researchers in

fields like anthropology, sociology, philosophy, medicine, and others are exhibiting a renewed interest in dreams and dreaming. As this renewed interest develops, so too will the significance of the study of dreams and dreaming and its importance. There are untapped areas of systematic research not only in relation to dream data in and of itself, but between dream research and other traditional research areas such as culture, socioeconomic class, history, sex roles, racial relations⁹, child development, gerontology, health, medicine, language, imagery research, psychopathology, stress, and so on. One of the unique advantages of dream research is that since dreams are generated involuntarily and non-consciously, information not easily obtained from the waking state can be obtained from dreams and can therefore be considered a part of what social psychology calls unobtrusive methods of inquiry.

Finally, if I may attempt to answer the question of where the now nascent scientific study of dreams and dreaming may ultimately lead, I would have to say, as I have stated before (Haskell, 1982, 1983, 1984), that the study of dreams and dreaming will become part of a more encompassing framework that will explain what we now term symbolic cognition and consciousness. It would appear that the study of dreams and dreaming is a crucial area of cognitive research. A larger framework of symbolic cognition would include the structural anthropological study of cultural myths as well as the study of poetic processes. Martindale (1981) has also argued that cognitive psychology should research poetic-type processes. Both fields are a rich source of cognitive operations virtually neglected by cognitive psychology. A closely related area is the study of figurative language which has recently attracted considerable interest in psychology (see Haskell, 1986a; Honech and Hoffman, 1986).

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⁹Along this line of research, I have found references to "race" in dreams and dream type waking "stories" to be an interesting way to obtain subjects' attitudes unobtrusively, and to gauge the extent of social values around racial issues (Haskell, 1986c).

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