Dream Psychology: Operating in the Dark

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The questions I want to address today concern the scientific significance of lucid dreaming, especially for our understanding of the function of dreaming. There is an emerging consensus that scientific dream psychology has not lived up to the potential which motivated much of the research following the discovery of REM sleep in 1953 (see Antrobus, 1978). For ex-ample, Foulkes (1976; 1982; 1983a; 1983b) has claimed that the three foundation disciplines of dream psychology, specifically psychoanalysis, psychophysiology and evolutionary biology, in fact have contributed very little to our scientific under-standing of dreaming. Similarly, Fiss (1983) has argued that we desperately need a clinically relevant theory of dreaming. One important reason for this apparent lack of fruitfulness is the exclusion of lucid dreaming from the central concerns of dream psychology. Ogilvie (1982) has aptly observed that until recently lucid dreaming has been consigned to the "wasteland of parapsychology". This exclusion of lucid dreaming from scientific dream psychology finally has been rendered untenable by the dramatic demonstration by a number of researchers that lucid dreaming is a scientifically real phenomenon (Covello, 1984; Dane, 1984; Fenwick, Schatzman, Worsley & Adam, 1984: Hearne, 1981, 1983; LaBerge, 1980a, 1980b, 1981; LaBerge, Nagel, Dement & Zarcone, 1980; Ogilvie, Hunt, Tyson, Lucescu & Jeakins, 1982; Tholey, 1983; Tyson, Ogilvie & Hunt, 1984). 'Scientifically real' in this context means that researchers such as LaBerge were able to show, among other things, that prearranged signaling was possible from lucid dreaming during stage REM sleep without the intervention of an electrographic transition to the waking state. In effect, the dreamer was simultaneously awake and asleep. The significance of this finding has yet to be fully appreciated within dream psychology in par-ticular or cognitive psychology more generally.

Before proceeding to the significance of lucid dream-ing, however, certain preliminary issues must be considered. What is meant by the phrase "lucid dreaming"? There is obviously no single definition of lucid dreaming which would cover the full range of phenomena which have been reported by skilled lucid dreamers (see the preceding references, and in addi-tion, Brown, 1936; Gackenbach, 1978; Garfield, 1984; Gillespie, 1984; Green, 1968; Van Eden, 1972; Reed, 1978). Some researchers only attribute lucidity to the dreamer when cognitive abilities in the dream state appear to be approximately equivalent to those of the waking state (Tart, 1979). We prefer a mini-malist definition, the awareness that what one is experiencing while dreaming is a dream, without the necessity that other cognitive capabilities of the dreamers are altered in any way. We prefer such a definition because in our research we use individuals who are not skilled lucid dreamers. We recognize, of course, that lucid dreaming represents a

continuum of content and process from the minimalist to the elaborate and sustained. However, for most of the issues to be considered in this paper the fact of simple lucidity is as important as its more complex forms.

Our research, which is reported on in detail elsewhere (Purcell, Mullington, Moffitt, Hoffmann & Pigeau, in press) indicates that lucidity of the minimalist type occurs spontaneously in about 1 to 2 percent of experimental awakenings in our laboratory in adult dreamers not selected for lucid dreaming ability. This figure is similar to the results of other experimental studies with ordinary dreamers (Hoffman & McCarley, 1980; McCarley & Hoffman, 1981). In our research such spontaneous occurrences of lucidity are generally brief and unstable, followed usually by a return to non-lucid dreaming or a transition to the waking state.

As I said earlier, the significance of the occurrence of spontaneous or intentional lucid dreaming in the laboratory situation for cognitive science cannot be underestimated. The fact of lucidity leads to the conclusion that dreaming shares a fundamental property of all cognitive systems, specifically self-reference or self-reflection (Hofstadter, 1985; Humphrey, 1983; Jantsch, 1983; Maruyama, 1963; Maturana & Varela, 1982; Prigogine & Stengers, 1984). The term we use to characterize this important property in self-reflectiveness is based on the work of Ernest Rossi (1972). The scale of self-reflectiveness which we have derived from Rossi's work is presented in Table 1. It is a nine step scale with level one repre-senting unfamiliar images without the dreamer present in the dream and level nine representing minimalist lucid dreaming. This scale is very useful for the clarification of terminology. Table 2 presents the ordinal values of the self-reflective scale and our understanding of the terminology of others working in this area. As one can see, this table is useful in clarifying otherwise problematic terms such as Rechtschaffen's (1978) notion of single-mindedness, or the categories used by Ogilvie and colleagues of non-lucid, pre-lucid and lucid (Ogilvie, Hunt, Tyson, Lucescu & Jeakins, 1982; Tyson, Ogilvie & Hunt, 1984). Table 2 also indicates the possibility, indeed the necessity, of scaling the self-reflectiveness con-tinuum to include higher levels of lucidity.

Table 1

Self-Reflectiveness Scale Categories
In Abbreviated Form.

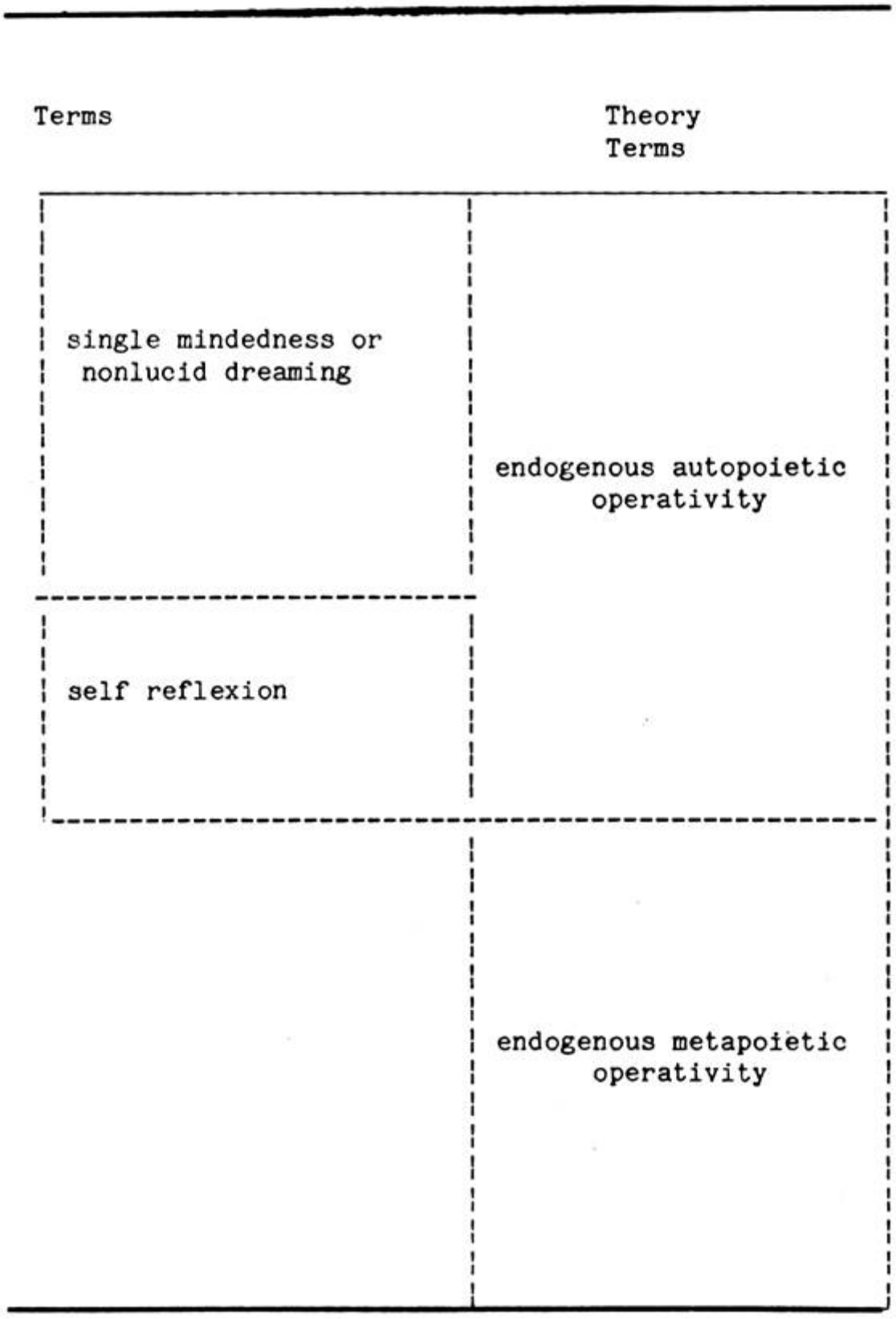
CATEGORY	PROCESS LEVEL
1.	Dreamer not in dream; objects unfamiliar; no people
2.	Dreamer not in dream; people or familiar objects present
3.	Dreamer completely involved in dream drama; no other perspective
4.	Dreamer present predominantly as observer
5.	Dreamer thinks over an idea or has definite communication 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, 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.

Table 2

Scale Level	Organization or Consciousness	Process	
1	: unfamiliar images	seeing	
2	: familiar images		
3	: particiaption	perception/ action dimension	normative dreaming
4	: looking/watching		
5	: language and thought	reflection	
6	: transforms of self- : identity	self-representation	
7	: transforms of : awareness	prelucid	
8	: control		
9	: fleeting lucidity	Godel crisis	
...			
10	: sustained lucidity	recursive autopoiesis	
...			
n	: action lucidity		
...			
o	: experimental : lucidity	(self-) reflective autopoiesis	
...			
p	: ?		


Terms
Theory Terms
single mindedness or nonlucid dreaming
endogenous autopoietic operativity
self reflexion
endogenous metapoietic operativity

It is now widely recognized in psychology that lan-guage, cognition and ordinary waking experience all have this property (Flavell, 1977; Humphrey, 1983; Paillet. & Dugas, 1982; Suls & Dugas, 1982; 1983). In addition, it is recognized as a fundamental developmental emergent during human ontogeny (Fishbein, 1976; Flavell, 1977; Laughlin & D'Aquili, 1974). The recognition that dreaming also shares this property has important implications for our understanding of dream-ing and its relation to waking experience.

For us the most important implication is that all experience is potentially self-reflexive, not just waking experience. This strongly implies the exist-ence and operation of common recursive mechanisms in the organization and production of experience in both states. Furthermore, because lucidity represents a correct judgement concerning the current contents of awareness during sleep, any interpretation which views dreaming as necessarily derivative in relation to normal waking consciousness is untenable, especially those classic interpretations of contemporary dream psychology which see dreaming as necessarily hal-lucinatory and/or regressive (Hartmann, 1973; Koukkou & Lehmann, 1983; Koukkou, Lehniann & Angst, 1980; Rechtschaffen, 1978). Consequently, the assumption that dreaming represents the result of random processes, as proposed in some neurophysiological and psychophysiological theories of dreaming can be seen to be false (McCarley, 1983; McCarley & Hobson, 1979). Instead, we conclude that dreaming, like cognition and language is an epigenetic system capable of correct self-reference. It necessarily follows that Crick's (Crick & Mitchison, 1983) assertion at the neurophysiological level cannot be correct. Finally, the research indicates that many lucid episodes are 'triggered', often by noticing bizarreness in the dream. However, some episodes appear to be totally spontaneous. They just happen. Thus, awareness in the dream is self-reproductive and self-organizing. The stream of consciousness leads to consciousness of the stream. Further levels of self-reproductive organization of awareness are of course possible, as the distinguished experimental and phenomenological research of participants in this conference have demonstrated (see the preceding references). We conclude, therefore, that dreaming in general and lucid dreaming in particular is a self-organizing, self-reflective and self-reproductive endogenous process. Both cognition and language share these features. Such features define generative dissipative systems, systems which are both open and creative (London & Thorngate, 1961; Prigogine, 1976; Prigogine & Stengers, 1984). It is a mistake, however, to assert as Foulkes (1982) does that dreaming is to be understood as equivalent to either cognition or language. They may share common mechanisms, but they are not identical. Neither cognition nor language contains an exact homologue to lucid dreaming, even with a minimalist definition: analogues yes, but not homologues.

We may now approach the important question of function. What is the function of dreaming? Why do we dream? Why do we dream the way we do? Numerous answers

have been proposed to these questions, none of which has been very convincing to scientific dream psychologists in the long run. It is clear that dreaming is a sufficiently complex activity that it can support any interpretation whatsoever with respect to function, including none at all (Moffitt, Hoffmann, Wells & Shearer, 1985; Moffitt, Hoffmann, Wells, Armitage & Shearer, 1985). Indeed, the dominant scientific interpretation of the function of dreaming since the logical positivists has been that dreaming serves no function at all (Dennett, 1981; Fodor, 1981; Malcom, 1959). Crick's revival of a variant of this position is a restatement of this ideological claim. The question I want to consider at this time is whether lucid dreaming has anything to contribute to our understanding of the function of dreaming, especially as something more than an epiphenomenon of neurophysiological activity.

What then is the function or functions of lucid dreaming? Why would a form of awareness during sleep evolve which is capable of giving a correct descrip-tion of its own state while in that state? We think the answer is fairly simple and follows from the characterization of dreaming as self-organizing, self- reproductive and self-referential. Waking consciousness is also a self-organizing, self- reproductive and self-referential system (Humphrey, 1983; Laughlin & D'Aquili, 1974; Laughlin, McManus, Rubinstein & Shearer, 1985; Maturana & Varela, 1982). As Hunt (1982; 1564; 1965) has noted, waking con-sciousness frames the experience of dreaming. The function of dream content, therefore, is to call attention to itself, to be noticed. Normally this noticing occurs across a major transition in the physiological organization of state, and we speak of dream recall under these circumstances. We may then question the nature of experience while awake and compare it to a dream. In the case of lucid dreaming we notice that we are dreaming without changing to the waking state. Two consequences result.

The first consequence of lucidity pertains to the waking state. When we recall a lucid dream we notice that we noticed that we were dreaming. The result is that when awake we are obliged to question what in fact it means to be awake. The function of lucid dreaming for the waking state therefore is to render our understanding of what it means to be awake as relative rather than absolute (Chang, 1974; Gyatso, 1975). In other words, the function of lucidity is meta-epistemic (Kitchener, 1983). It requires us to revise our understanding of what it means to be asleep and to be awake (see for example Malcom, 1959). It is this consequence which is likely to result in con-siderable resistance within cognitive psychology to the assimilation of dream psychology. Scientific cognitive psychology has scrupulously avoided the question of awareness with all its problematic implications (however, see Marcel, 1983; Shepard, 1984; Yates, 1985). Lucid dreaming is exactly the sort of anomalous datum which Kuhn (1970) has suggested precipitates a paradigm shift. We look forward therefore, to the assimilation of dream psychology into cognitive psychology as proposed by Foulkes and Antrobus. When this happens the character of cogni-tive psychology and cognitive neuropsychology will be permanently altered.

One such revision is that the meaning of the expres-sion 'being awake' can no longer be regarded as univocal. Cognitive psychology can no longer make the assumption that being awake has a clearly defined, univocal meaning (see Fodor, 1981). The immediate consequence of this opacity of meaning is that the problem of awareness must emerge as a central problem of any revisionist cognitive psychology or cognitive neuropsychology which purports to include dreaming within its domain (see Shepard, 1984). Foulkes (1982) has argued that dream psychology should become assimi-lated with cognitive psychology and Antrobus (1978) has suggested an assimilation with cognitive neuropsychology. If such assimilations should occur, it is fundamentally important that lucid dreaming be included in dream psychology. Otherwise, cognitive psychology and dream psychology will both be the poorer. Yates (1985) has argued that cognitive psychology would benefit from a reintroduction of the concept of awareness, yet lucid dreaming was not among the evidence he adduced in support of this proposal. Such an oversight must be corrected, and it is the people at this conference who are in a position to make sure that the functional and scientific sig-nificance of lucid dreaming is not ignored by dream psychology and cognitive psychology.

The second consequence of lucidity is equally important, and bears directly on the nature of the altered character of a cognitive psychology which has been broadened to include lucid dreaming. Lucidity enables the further development of intentional action within the dream state. In effect, one can develop a new form of competence, a form of operativity not avail-able during the waking state. As the astute observations of many researchers at this conference have already demonstrated, this operativity is of a different order than found in the waking state. It is different, not derivative. This is the case because the affordances of perception and of action are not the same in the dream state as in the waking state. Consequently, we may reject claims such as those made by Koukkou and Lehman (1983) that we are concrete operational in the dream state. Many of the opera-tional skills of more advanced lucid dreaming are of a different form in comparison to either concrete or formal operational intelligence during the waking state. These skills represent a form of human competence which <u>are sui generis</u>, of their own type. They depend initially upon the simple but difficult act of noticing that one is dreaming while dreaming. This noticing, when cultivated, enables the develop-ment of operativity in the dream state. This type of competence defines an internal ecosystem with unique affordances with respect to the self-referential dynamics of subjectivity (Gibson, 1970; 1977; 1979). Cognitive psychology, especially cognitive developmen-tal psychology has ignored the development of unique forms of competence associated with lucid dreaming. The functions of such competence are analogous to the functions of cognitive, meta-cognitive and epistemic competence during the waking state, the creation of knowledge based on experience and the creation of experience based on knowledge. As Humphrey (1983) has suggested, "...we lack even the bare bones of a good story about consciousness in human beings..." (p. 46). Lucid dreaming is an essential part of that story. It must not be left out of the integration of dream psychology into cognitive

psychology, experimental phenomenology or what Humphrey has called 'natural psychology'.

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