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Some Relations Between the Cognitive Psychology of Dreams and Dream Phenomenology

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Cognitive approaches to dreams are limited by the conceptual and methodological narrowness of current "cognitive science," obscuring the actual multiplicity of dream experience. While there may be nothing essentially or uniquely dreamlike, this very multiplicity could have a liberating effect on cognitive theory, by calling attention to the need for a psychology of visual imagination and metaphor and by reinforcing recent views on the multiplicity of waking consciousness.

Limitations in the Relevance of Current Cognitive Psychology for Dreams

I would like to address the theme concerning the potential relation between dreaming and cognitive psychology, and its generally unstated assumption that dreaming will be understandable as a derivative of waking functioning. In the context of the supposed bankruptcy of psychoanalytic, evolutionary, and psychophysiological perspectives on dreams (Foulkes, 1983a), some theorists now argue that the right view is finally in sight and that dream psychology will be properly assimilated to the domain of cognitive psychology, usually meaning in its current form as centered on the experimental study of representational processes, psycholinguistics, and artificial intelligence.

Certainly dreaming is a cognition, among other things, but those of us who are about to be eaten should perhaps reflect: have we escaped the reductive teeth of psychoanalysis and psychophysiology only to be consumed by cognition? And is that the best that we can do for cognitive psychology? Perhaps it is the strategy of making dream psychology "respectable" by assimilating it to any narrowly defined system that is bankrupt, and the danger is that

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current cognitive psychology will simply continue that Procrustean tradition. Dreaming needs a cognitive psychology, but perhaps that is a two-way street. Certainly current cognitive psychology is far more narrow than its promise of a psychological account of the human symbolic capacity should imply and thereby probably too narrow for the task of assimilating dream psychology.

For instance, cognitive psychology as presently practised is experimental, but as Moffit, Hoffmann, Wells, Armitage, and Shearer (1985) point out, if experimental psychology is based on the causal tracing of input-output relations, where does dreaming come in? We do not have any meaningful idea of the input. Perhaps instead the study of dreams would help to establish the utility of a phenomenological method *for* cognitive theory. Or, experimental psychology is functional. But if we consider the diverse and impressive evidence offered to support theories that dreams reproduce the past, anticipate the future, metaphorize current problems, or afford opportunity for lucid self-experimentation, then dreaming has no one function at all but rather many potential uses or lines of articulation. What if dreaming is an exercise of potentially diverse faculties of mind for their own sake, independent of any function? Or, consider, experimental cognitive psychology is linguistically and representationally centered (especially obvious in the application of cognition to dreaming proposed by Foulkes [1983a, 1983b]). But if dreaming, especially in its creative, bizarre forms, is mainly visual-spatial and metaphoric, and if, following Gackenbach's work, (see Gackenbach, Curren, LaBerge, Davidson, and Maxwell, 1983), lucid dreams show the development of spatial-imaginative abilities, then a genuine cognitive psychology of dreams becomes a contribution to that cognitive theory which centers on the non-linguistic and metaphoric, i.e., to the sort of heterodox approaches to cognition associated with Werner and Kaplan (1963) and Arnheim (1969). Indeed this was the original thrust of Calvin Hall's (1953) call for a cognitive psychology of dreaming. Perhaps the right metaphor for our situation is that of Jonah and the whale, and we should recall that the latter plays a supporting role at best.

A major problem for any cognitive psychology of dreams is the protean quality of dreams. Like waking consciousness, or indeed even more so, dreaming may have no set or fixed nature; dreaming may simply have no essence. Indeed Wittgenstein (1966), in one of the most interesting critiques ever attempted of Freud's approach to dreams, asks why we would expect an essential nature to the dream. Is there an essence of walking and talking? Rather there are contexts of usage so different that any "essence" is either falsified immediately or stretched to the point of useless truism.

Is dreaming a form of *remembering*? Kramer and Kinney's (1985) recent work on post-traumatic dreams in Vietnam veterans shows once again how dreams can become almost exclusively a bitter repetition of the past. Are dreams

a form of *forgetting* as Sir Francis Crick (1984) and James Hillman (1979), otherwise at opposite poles of just about everything, have both suggested? Is it a form of *anticipation* and/or current *problem solving*? Van Dusen (1972) and many others have extended Jung's original contribution here. Or, is the dream first and foremost understandable in terms of *perception*? After all, the most basic thing to say about the REM state is that it alerts the organism in a way highly similar to the waking state. Studies by Roffwarg, Herman, Bowe-Anders, and Tauber (1978) on the carry over of prism effects into dreaming, and by Herman, Barker, and Roffwarg (1983) on the similarity of rapid eye movements to scanning movements in darkened surroundings, suggest that concepts pertaining to the constructive side of perceptual processes will be necessary to dream psychology. On the other hand, fantastic and bizarre dreams, as well as Kerr, Foulkes, and Schmidt's (1982) findings on dreaming in the blind and in individuals with Turner's syndrome (Kerr, Foulkes, and Jurkovic, 1978), suggest that it can and does operate more like *imagination* than perception. If or when dreaming is a form of *thinking*, i.e., *when* it is clearly novel, creative, and recombinatory in its use of past waking experience, what sort of cognition is involved? Foulkes suggests that dreaming is ultimately linguistic and mnemonic in source, while Hillman (1979) and Hunt (in press) suggest a visual-spatial "deep structure" and a basis in productive imagination. And why could not these two forms of intelligence interact in complex emergent ways? If dreaming is a form of thinking, is it regressive, as the recent physiologically based analysis of Koukkou and Lehmann (1983) would suggest, in their interesting revival of Freud's model of dream formation; or is it progressive, showing an abstract metaphorical capacity of the sort located originally by Jung and extended more recently by Haskell (1984)? Again, it can seemingly be both and neither. There are dreams and types of dreams that invite some of the above characterizations and there are dreams that repel them.

Dream Phenomenology and the "Dreamlike": A Chimerical Pursuit of the Essence of Dreaming

When we step back from theories and functions and attempt "merely" to describe the features that might uniquely define dream consciousness, we are again struck by the protean multiplicity of dreaming. All supposedly criterial features turn out to be relative and possibly quite malleable in a cross-cultural context. Even the ones that appear to be most certain merge into features and potential features of waking experience. Most obvious here is Foulkes' suggestion that the essence of dreaming lies in its narrative, story-like structure. This simply will not help us with dreaming *as such* because that is also a defining capacity for much of human symbolic cognition. Yet most people

seem to sense strongly that dreams are . . . dreamlike. My own work on the classification of types of bizarre or fantastic transformation typical of dreams is especially instructive and cautionary in this regard (Hunt, in press; Hunt, Ogilvie, Belicki, Belicki, and Atalick, 1982).

I inspected diverse collections of dreams looking for all points where the narrative departed from stories that plausibly might be told of everyday waking experience. I tried to classify these departures in terms of the perceptual, cognitive, volitional, and inter-personal anomalies involved. Yet all my carefully worked out categories of dream bizarreness had their close parallels in the varieties of waking altered states of consciousness. For instance, consider the sudden changes of scene that are held to be so characteristic of dreaming. I found them in only 20% of home recall dreams. More importantly, they bear a striking similarity to the sudden shifts of perceived and imaginal setting characteristic of delirium syndromes. Delirium syndromes are also characterized by the sorts of reasoning and memory confusions ("clouding of consciousness") that were the most prevalent forms of dream anomaly in our ratings. Seeing oneself as if from outside, actually very rare in dream samples, is of course very hard to separate from autoscopic hallucinations and out-of-body experience, the latter also including descriptions that seem identical to the sensations of flying in some dreams. Not only were overt forms of Freud's "mechanism" of condensation rare in normative dream recall (less than 10%), but they can also be found among Klüver's (1966) categorizations of visual-spatial reorganizations in waking hallucinations occurring with various psychedelic drugs. Normatively, of course, dreaming leans more towards certain kinds of altered states of consciousness, related to confusional states. When I asked subjects to fill out a questionnaire describing a wide variety of possible spontaneous altered state-like experiences, the only waking categories that subjects avoided for describing their dreams were those related to unusual concentration and absorption. But even there we find an important exception in lucid dreams.

Of course, we might take an opposite tack and suggest that if there is nothing truly unique to dreams, in that all forms of dream bizarreness overlap into waking alterations of consciousness, then perhaps the latter should be understood as themselves the eruption of dreaming into wakefulness, an old and hallowed idea. However, it does not really help here. As we have seen, the varieties of dream bizarreness are not as frequent as their modifier "dream-like" would imply. Much dreaming is surprisingly realistic and true to daily life in thematic content and cognitive form (Synder, 1970). So the important distinction empirically may not be between dreaming and waking at all, but between symbolic consciousness manifested as such in emergent, creative imagination versus consciousness subordinated to the pragmatic demands of constructing and maintaining the everyday common

sense world, a distinction cutting across both dreaming and wakefulness.

Yet I would agree that for most individuals dreaming is a definite identifiable "something" in *our* lives. Although this may well be because dreaming has developed for each of us along one of many possible lines. At any rate, it is tempting (and possibly true) to believe that dreaming can be characterized as a general process in its own right, cross-cultural and universal. Let us consider a number of related attempts along these lines—to locate not what intrudes into dreaming as bizarreness but what is "missing" or "absent" from the dream. In so doing, investigators follow the lead of Hughlings-Jackson (1958) and ignore "positive" (compensatory) features in favour of background "negative" symptoms to be located by looking more at the overall context of functioning. What does dreaming *lack* that waking consciousness typically *has*? Rechtschaffen (1978) has suggested that dream experience is limited by its "single-mindedness,"—the isolation of dreams from each other (their lack of continuity in contrast to waking experience) and the isolation of dreaming from the full use of our waking reasoning capacity. This is very similar to what Boss (1977) has termed the narrowing of the dream to the mode of the immediate present and to Johnson, Kahan, and Raye's (1984) idea of the loss of context within dreaming. Boss, while insisting that dreams show all the existential potentialities of waking, nonetheless concludes that dreaming necessarily narrows the openness and freedom of waking life. The dream starts and stops, holds us to its immediate setting, and finally ends with the special expansion of awareness that comes with awakening. Then the immediate "thereness" and concreteness of the dream as held in our memory can start its shift toward potential metaphor—which can never happen within the dream but only with the recovery of context that comes with awakening.

However, none of these characterizations are essential or criterial, but at best reflect the same *tendency* toward clouding and delirium discussed above. First, single-mindedness and narrowing to the immediate present are only characteristic of some dreams and may indeed be an accident of background REM physiology, i.e., of its *relative* vestibular deregulation. Secondly, these characterizations ignore the potentiality of dreams, in children as young as four or five years, as a matter of fact, to become self-reflectively lucid. In other words, the expansion of awareness that Boss locates only within wakefulness can also occur *within* dreams, when we recognize that we are in a dream and either contemplate its metaphorical significance or actively change it.

Perhaps this model of a single-minded "essence" of the dream should be used instead to call our attention to the more difficult task of seeing the full context of our *waking* lives—just how episodic our waking experience really is, how difficult it is to reflect on our overall situation, and how little we make use of our symbolic capacity when awake. Lewin's (1936) "life space"

methodology attempted to represent topologically the subject's immediate situation at a moment in time. The attempt to use Lewin's drawings descriptively actually shows just how radically one's world can change moment by moment and how psychologically insulated from each other these life spaces can be.

Boss and Rechtschaffen managed to define dreaming so as to make lucidity either impossible or an actual mental waking up *in* the dream that proves their rule. However, close study of lucid dreams shows that lucidity is not a mental waking up, a simple approximation of the dream mind to our waking faculties. Even the most experienced lucid dreamers can show striking confusions of reasoning and memory in their lucid dreams with an inability to think through the full implications of being in a dream. Perhaps that in itself would make the point that dreaming is ultimately single-minded and narrowed to the present were it not for the fact that we have a difficult time thinking through the full implications of being alive as well. It is the phenomenology of dreaming that actually helps to underline a more general point made by the psychoanalyst W.R. Bion (1962), that "the capacity to think is rudimentary in all of us" (p. 14). *People* are single-minded.

But surely then lucidity, as the potential of the dream state to recognize itself, *must* show processes unique to dreaming? Again, I doubt it. Rather, lucid dreams are equally different from 90% of dreams and 90% of waking experience. They share with out-of-body experience, and especially with meditation, the special sense of clarity and exhilaration (reminiscent of Maslow on "peak experience") that comes with the emergence of a detached receptive attitude in the midst of our more narrow everyday involvements, whether dreamt or real. Lucid dreams are a spontaneous form of the state sought within so called "insight" or "mindfulness" meditative traditions. They *transform* dreams in the same way that meditation transforms wakefulness. Of course, the best evidence for equating lucidity and meditation comes from the development of lucid dreams in advanced Tibetan Buddhist practice (Chang, 1963), which such practitioners understand as a form of meditation available during sleep. In addition, my colleagues and I at Brock have extended earlier suggestions by Goleman (1971) and Sparrow (1976) by showing strong correlations between lucid and control dreams and meditative practice in both a group of long-term meditators and novice experimental subjects. We also found that just as waking meditative practice eventually leads to the release of major alterations of consciousness such as white light experience, so there were significant associations between degree of lucidity in our long-term meditators and archetypal/psychedelic dream content rarely seen in normative dream samples, such as geometric mandala patterns, encounters with archetypal figures, and various luminosity phenomena of the kind also described by Sparrow (1976) and Gillespie (1985). We were especially interested to find

that some of our subjects were not sure themselves how to categorize their highly unusual dreams. They sometimes could not tell whether they had awakened and were spontaneously meditating or whether they were asleep and having what we had defined for them as a lucid dream.

With respect to the cognitive capacity common to meditation and lucid dreams, it is worth noting that not only has Gackenbach et al. (1983) found correlates between lucid dreaming and performance on visual-spatial imaginal rotation tasks but there is a striking overlap between the phenomenology of lucid dreams and out-of-body experience. Now the latter seems to involve this same imaginal rotation capacity but here translated into a direct reorganization of the schemata of visual perception, spatially rotated in terms of how one *would* look from a "decentered" physical perspective. Out-of-body experience shows the same ability to be in a situation and simultaneously see it from an "outside" perspective that Piaget tested in children with a model of three mountains—concluding that children under nine were too egocentric to pick photographs, taken from perspectives other than their own, to match how a doll would see the mountain from a different angle. Since accounts of out-of-body experience and lucid dreaming can date to ages four or five, there may seem a difficulty in this understanding of the imagery aspect of out-of-body experience in terms of spatial reversibility, but current work (e.g., Borke, 1975), as with much else from Piaget's original reports, has dated accuracy in the mountain situation back to ages three or four. On the other hand, it may well be that the *development* of visual-imaginative thinking is quite distinct from the functional capacities that Piaget so carefully traced. Whereas the sequential structure of language and motor skills may require a developmental reversibility, the simultaneously given spatial structures of visual intelligence may come already reversed, requiring instead that implications be spelled out and articulated as their form of developmental achievement—as seen for instance in the interpretation of metaphoric aspects of bizarre dream imagery. Certainly, it does not appear likely that such experiences are normative at the early ages at which they *can* be reported. So we are left with the view of an abstract imaginative capacity potentially available to us but ordinarily suppressed by more pragmatic and linguistically centered functioning.

A final piece of relevant cognitive research that may assist in linking dream lucidity and out-of-body experience to processes more general than dreaming comes from Nigro and Neisser's (1983) recent work on "observer" memories. In observer memory we recall a past situation as it might have been seen at the time by another observer—an out-of-body memory structure in contrast to our more predominant, egocentric "field" memories. Observer memories are associated with original situations of high emotionality, and/or high self-awareness, and/or material from the distant past, and Neisser suggests that

the original experience may also have been undergone in the out-of-body mode. He suggests that observer memories imply a more complete cognitive assimilation and contextualization of experience than found in ordinary memory—as rare in dreams as it is in waking mentation.

If this comparison between lucidity and meditation is correct, how is it that the sustained receptive attitude of meditation actually seems to be more readily manifested in a spontaneous and intense form when we dream than when we are awake, especially if dreaming has a *relative* tendency towards clouding and delirium and the receptive attitude rests upon a sustained cognitive clarity? I would suggest that while the physiological conditions of dreaming *can* entail a *relative* cognitive impairment, they also uniquely *favour* an attitude of observational detachment from ongoing involvement. Presumably this is because the perceptual-motor patterns of dream experience are not "enforced" and reinforced as in waking by the sustained stimulation of the environmental array. The same degree of self-reflective abstraction when awake would thus *require* the concrete behavioral withdrawal from such stimulation, as seen directly in the meditative posture and practice. Thus, despite the relative clouding of consciousness in some dreams, beyond a certain point in its potential clarity, dreaming will also be inherently open to the receptive-observational attitude that is the basis of the meditative transformation of consciousness. This, as the Tibetans say, may be better pursued while dreaming than awake.

A final point of interest: lucid dreams, out-of-body experience, and related phenomena can look very different depending on the kind of cognitive (and developmental) psychology we try to apply. If we take the capacity common to lucid dreams, out-of-body experience, and meditation as a non-verbal visual-spatial self-reflectiveness (which may require some degree of special intensification or energization for its articulation), then we can say that one mark of reaching the stage for such transformations would be what Green and McCreery (1975) call the metachoric dream, taken here in the narrow sense of hallucinating a version of the physical setting that one is in fact in. This is seen in false awakenings, out-of-body experience, some lucid dreams and apparitions, often with an increase in vividness and perceptual detail beyond that found in both ordinary dreaming and ordinary waking perception. I would suggest that the metachoric reconstitution of one's actual physical surroundings in dreaming and sleep onset is not just a simple reproductive use of perceptual schemata, as in the true to daily life settings of ordinary dreaming. Rather, it shows a self-referential attunement to one's immediate setting that overrides the state specific discontinuities of sleep and indicates a complete taking over of the dreaming process by an abstract imaginal capacity related to Piaget's notion of symbolic "imitation." It is the opposite of fantastic or archetypal dreaming, which for Piaget would show a predominance of symbolic assimilation. Each might have its own line of potential develop-

ment and further possibilities of complex developmental interaction. The metachoric reconstruction of one's actual setting may be very common in deep waking meditation and would help account for first person reports of the special powers or siddhis with prolonged meditation that are so reminiscent of the quasi-magical manipulations of lucid dream control and out-of-body experience.

On the other hand, the more orthodox view, that symbolic development is predominantly verbal-representational and that visual thinking is by contrast inherently primitive, has its problems with this material. Jaynes (1985) attempts to reconstruct the cultural history of dreaming in a way that is consistent with Foulkes' (1983b) interpretation of dream ontogenesis. Jaynes asserts that dreaming becomes progressively more vicarial (an analog *I* or self-representation does something other than sleeping or lying in bed) and translocative (the dream *I* is located in an imaginary environment distinct from one's bedroom). Jaynes is very struck by early historical accounts of dreams which seem to center on encounters with gods standing at the head of one's bed. In Green's terms these are false awakenings or metachoric dreams and are also prominent in modern accounts of apparitions (most common during the sleep onset period). Foulkes found that children at ages three and four generally did not recall dreams, but when they did, their dreams centered on themes of being asleep or tired, which he interprets in terms of egocentricity. These dreams can also be seen as more abstractly self-reflective, and Foulkes' account does not sit well with the occurrence of lucid dreams and out-of-body experience as early as four or five years of age. Certainly, for both Jaynes and Foulkes, Green's metachoric dreams are primitive and egocentric. Piaget (1963) found that very young children typically believe that their dreams are actually *in* the room or *in* the bed, but most of these same examples are also translocative and vicarial. So children's accounts of dream figures in the bedroom seem to be post-waking interpretations, not phenomenological. It seems most plausible to conclude that the early historical accounts of metachoric dreams cited by Jaynes were no more normative then than they are now, but appear prominent because they were so unusual and made such a strong impression. Actual dreams of one's bedroom show the sort of accurate self-reflective attunement that is the core of the meditative attitude which, while distinct from our predominant verbal-representational intelligence, is anything but primitive. Its unfolding would occur parallel to, but potentially distinct from, the stages of functional intelligence outlined by Piaget.

Again, not only do supposedly criterial features of dreaming merge into varieties of waking cognition, but depending on the kind of cognitive psychology utilized these same features shift abruptly between being labelled as primitive or advanced. This of course is best seen in the strong statistical

correlations between the predominantly visual forms of intrinsic dream bizarreness and phasic activations of the REM state. For Foulkes (1983b) and McCarley (1983) this shows that dream bizarreness is a primitive non-cognitive intrusion on the narrative fabric of dreaming, while for Hillman (1979) and the present author it would be the very stuff of self-reflective symbolic metaphor, appropriately all inclusive and so "driven."

Implications of Dream Psychology for Cognition

Dreaming in itself may not be anything. If you stare hard and long enough at something, it satiates and disappears. You have to glance back and forth between figure and ground to maintain any definite contour. Accordingly, dreaming, like everything else, must be studied always "in relation." Wittgenstein emphasizes the immense difficulties and relativities of real observation: it is never pure but always more or less influenced by the various pictures we bring along with us. We know something only in relation to something else. In ordinary thinking and science we treat one thing as fixed and finished when it never is in order to *use* it as a perspective or view for the thing we wish to question. Contrary to widespread assumption, the metaphoric vehicle is not necessarily better known than its referent. It is only treated *as if* it were known for the present purpose of casting light on something else (Wittgenstein, 1972).

As such, cognition is just another perspective on dreaming. So the relation can also be reversed. We may learn more about cognition if we look back at it through what we know of dreaming. There is reason to think that cognitive theory especially needs the sort of opening up that dream psychology and dream phenomenology might offer. Indeed, Freud (1900/1965) generated much of psychoanalysis *from* his dream studies, in one of the more fluid and fruitful interchanges ever associated with the discipline of psychology. Orthodox cognitive psychology specifically lacks the phenomenological attitude that would help insist on the sort of diversity in symbolic capacity suggested recently by Gardner (1983). We must remember here that dreaming seems to be a sort of echo chamber for diverse cognitive processes also found in waking. If so, the study of dreams for cognition fills a crucial gap in the latter. Dreaming is a form of experience that comes naturally *framed* for inspection as experience in its own right. The conditions of sleep, the episodic nature of dream recall, and relative but sometimes striking differences between dreaming and waking, actually help to create the very phenomenological attitude toward experience for its own sake that our overly utilitarian experimental psychology lacks. It is not that dreaming is ultimately so very different from waking consciousness, but that dreaming frames itself for inspection in a way that waking consciousness does not, and so forces on us the reach and range

of material that a genuine cognitive psychology must address.

What do we learn if we look *from* the phenomenology of dreaming and its variations *to* cognition: through dreaming at cognition? First, let us examine Moffitt's perspective. Moffitt and his colleagues have shown (see Moffitt et al., 1985) that it is dream phenomenology that renders psychophysiological data intelligible and so (Foulkes to the contrary) clearly relevant to both dream psychology and a cognitive psychology of dreams. It is especially interesting that Moffitt can render the ephemeral but tantalizing findings of hemisphere differences in the REM state intelligible as a function of type of dreaming and dream recall. The importance of an open-ended, natural observational attitude is also shown in a study by Schanfald, Pearlman, and Greenberg, in press) that contradicts reports of loss of dreaming with left hemisphere linguistic damage or right hemisphere damage to imagery abilities. Schanfald shows that patients produce seemingly ordinary dreams with a maximally supportive approach, i.e., that the ostensible loss found in other more widely cited studies pertains to performance and not competence. Once again "phenomenology" deals with the systematically "neat" view that the deep structure of dreaming is linguistic (left hemisphere) and that its surface expression is necessarily in a right hemisphere predominant "imagery."

Natural observation and descriptive approaches to dreams call into question some supposedly more "objective" sleep laboratory findings, such as Foulkes' (1983b) fascinating but questionable research showing that children aged three to four apparently dream very little and that the dreams reported are basically static images, with little or no narrative transformation or dynamic movement and with the appearance of more true-to-life dreaming correlated with the development of Piaget-type tasks measuring the capacity for voluntary imagery. In other words, dreaming for Foulkes is necessarily a form of active imagination in its very essence and very young children and animals thereby would not have that capacity. The problem here is that a rich and long existing anecdotal literature on children's dreams (Piaget, 1962; Werner and Kaplan, 1963) shows complex, dynamic, spontaneous nightmare and non-nightmare dream recall in children younger than three, as many parents will also know. Certainly observational-phenomenal methods have their limitations, but so does the sleep laboratory. No theory of the cognitive-developmental bases of dreaming can afford to exclude the rich confusion of the empirical phenomena of dreams in favour of a methodological or theoretical straitjacket, howsoever "tightly" appealing they may be. (I have commented further on these developmental controversies elsewhere [Hunt, in press; Hunt et al., 1982].)

Taken seriously, dream phenomenology encourages a re-expansion of perspectives in cognitive theory itself. Rather than leading us to the representational-propositional models currently in vogue, it would have us

look again at the more organismic-holistic traditions of Werner and Kaplan (1963), Arnheim (1969), Bartlett (1932) and Neisser (1976), which are naturally attuned to both phenomenological descriptions and the notion—so clearly shown in creative, bizarre dreams—that higher mental processes are *of* the senses and their recombinatory re-use. Nothing could be further from the current artificial intelligence emphasis. The best it has done for us is to dismiss our entire field of study as "neural dumping."

Along these lines, dream phenomenology insists on the complex interdependence of the processes of perception, mnemonic imagery, and symbolic imagination. It forces a rejection of simple-minded attempts to *either* completely identify or completely separate imagination and perception. Dreaming itself is *now* more like perception, and better understood by the sort of extension of Gibson's views into mnemonic imagery proposed recently by Shepard (1984). Now it is more like creative imagination, independent of and creatively synthesizing the specific structures of the separate senses.

Witness here the complex findings of Gackenbach on the correlations of lucid dreaming: lucidity correlates with forms of spontaneous visual imagery, enhanced awareness of kinesthetic sensations in the dream, visual-spatial rotation abilities of the sort studied by Shepard, *and* with perceptually concrete measures of coordination and balance after vestibular disruption. These findings, along with the very existence of falling and flying dreams, could of course be understood in terms of a general vestibular disruption specific to REM physiology. If so, persons who have good balance in conditions that cause dizziness could overcome the natural delirium of REMing and become lucid. Others, however, like Green (1968), have related flying and falling dreams more directly to the dimension of lucidity. Green suggests that such dreams are based on the same *double* awareness of a *dreamt* and an *actual* body position basic to lucid dreams, out-of-body experience, and meditation. Along these lines, Swartz and Seginer (1981) have reported a significant correlation between the Hood scale of spontaneous mystical experience and a test of physical balance and coordination (pin the tail on the donkey). In an unpublished study, we not only replicated that finding, but also found associations among lucid control dreams, experimental meditation, and physical balance. In other words, Gackenbach's "balance" factor is not specific to dreaming *or* lucid dreaming, but is more generally related to the waking experiences that are most like lucidity. Gackenbach's notion of lucidity as "balance" can be taken equally well in the sense of a coordination of hemispherically distinct cognitive skills or literally as *physical* balance. We need a cognitive psychology, perhaps of the sensory-tonic kind of Heinz Werner, that can treat such findings as an organic whole.

Finally, consider the *various* ways that dreams can become fully symbolic and directed by abstract intelligence, the sorts of rare but widely studied special

developments of dreaming, like the narratively complex and intricate story dreams of Robert Louis Stevenson (1912) and other writers; lucid dreams and their relation to meditative practice; and the sort of visually complex archetypal scenarios described by Jung (1961) or H.P. Lovecraft (1962). Not only do these potentialities of dreaming argue against any one deep structure for dreaming in general, but they are fully consistent with the recent views of Gardner and others that there is no single "deep structure" for symbolic cognition, but rather multiple and *potentially* independent faculties, each developing a self-referential, recombinatory capacity in its own fashion. A cognitive psychology that takes the phenomena of dreams seriously would know better than to try for a fixed "code" for intelligence, whether linguistic, imaginal, dual code, or abstract-propositional. Certainly it would never have been caught by the view that self-reference depends on language, and would long ago have made room for the *presentational* symbolisms of music and visual art as of equal importance with the study of cognitive representations.

What then of looking *from* the dream *towards* everyday consciousness, rather than the other way around? Although they are only relative and highly malleable, features that are often suggested to characterize dreaming include Freud's view that dreaming can be visually fantastic, yet necessarily linguistically impaired, Rechtschaffen's "single-mindedness" and centering on the present, a strong tendency to repeat the traumatic past, and the potential for, but typical lack of, lucidity. If these really overlap into waking consciousness, we can use them to show us, slightly exaggerated, the nature of everyday consciousness, which otherwise we cannot see because we are, so to speak, "aswim" in it. Such an extrapolation leads us to the following conclusions about everyday life: our grasp of language is surprisingly tenuous (and interestingly we often sense this); we utilize metaphor imaginatively but in a far more limited way than we might; our experience is surprisingly episodic and narrow; we anticipate the future to a degree, but more often replay the past; we all have potential to develop our symbolic capacity in the direction of distinct specializations, but mainly we do not; and we have the potential to self-reflect on the overall context of our activities, but mostly it is too much effort and a bit beyond us if we try.

Still, the observational-phenomenological study of rare forms of specialization in dreaming may offer positive clues to cognitive processes underlying dreams in general. At least it seems possible in the following sense: it is clear that dreaming *can* be utilized in the service of creativity and discovery in and through very different symbolic faculties; i.e., we have ample evidence of dream discoveries in mathematics, science, music, writing, medicine, and sports (Shepard, 1984). But to my knowledge no one ever *became* a musician, or a mathematician, or perhaps even a writer as a *direct* result of developing those capacities mainly *in* and *through* dreams. But the development of dream-

ing in its own right does seem to lead to a progressive heightening and integration of the potential for visually fantastic metaphor and for lucid self-reflection, and it does seem that cross-culturally, certain people have become mystics and shamans directly as a result *of* and sometimes mainly *in* their dreams. In other words, developed for its own sake and in its own terms, the dream leans towards the expression of an abstract reflexive capacity in a simultaneously or immediately given visual-presentational mode, rather than, say, towards mathematics. This leaning towards an intelligence of metaphoric reflexivity is relative and perhaps indeed an accident of the REM state, but it also highlights a cognitive capacity about which contemporary psychology has almost nothing to say. Again we must go to the dissident organismic psychologies of Werner and Kaplan or Arnheim or to the heterodox approaches to metaphor in Ricoeur (1977) and Haskell (1984). Indeed, dream studies may offer the major evidence for the development of cognitive theories of metaphor.

Conclusions

I mentioned the necessity of always knowing things "in relation." In scientific investigation we naturally and unconsciously move back and forth between theories and data that alternatively do not fit one to the other and insist on something more or different. What is exhausted in dream psychology is not psychoanalysis, psychophysiology, motivation, or evolution per se, but one-way applications of fixed frames of reference to the phenomena of dreams, including the cognitive perspective, and especially including its current fixation on the experimental study of representational and linguistic processes.

If, as Boss (1977) has said, all the modalities of human existence are manifested in dreaming, there will be many lines of variation and potential development to trace through dreaming, not just one. I do not know if we will find true *functions* of dreaming, anymore than we have been able to for human existence. A self-referential, self-transforming system like the human mind will evolve its uses as creatively and unpredictably as it evolves its structures. Indeed there do seem to be distinct types of dreaming, each with its own line of articulation emerging out of ordinary true-to-daily-life dreams: a lucid-control line, a Freud-type pressure-discharge line, a Jung-type archetypal-mythological line, and perhaps a problem solving line and a Robert Louis Stevenson-type creative story line. It may be *because* dreaming (and human life) has no fixed function that it is open to so many different *uses*.

It is not so much that dream psychology needs cognition as that cognitive psychology needs dreams. What is it to dream? Probably nothing in essence or in particular. Dream studies are contemporary and "modern" in that they insist on multiple perspectives and a certain indeterminacy of method, i.e.,

dreaming can change as a result of systematic scrutiny. If we do not know what dreaming is, but find this special window to the mind fascinating in its protean qualities, why should we take cognitive psychology's word for what we already know better?

Wittgenstein suggested that understanding is based on looking at one thing in terms of another, which we treat *as if* fixed and final for the purposes of looking through, even though nothing *we* can know could be fixed or finally comprehended. But if *we* know that dreaming is protean and multiple, admitting of no essential characterization, and we look with it back at the discipline of cognitive psychology, then surely that is a positive and liberating step for a time when psychology and lots of other things are apparently *supposed* to be "artificial." The only thing a cognitive psychology of dreams cannot afford is lack of imagination.

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