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Session 1: What is a Lucid Dream: Psychological and Physiological Considerations

Dream Content Within the Partially Lucid REM Period: A Single Subject Content Analysis

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Despite ten years of increasing research attention to lucid dreaming, quantitative content analysis is almost nonexistent. Most research describing their content has dealt almost exclusively with those qualities of the dreamer's consciousness that by definition serve to differentiate lucid dreams from their non-lucid counterparts. But aside from obvious differences in self-awareness and cognitive ability, in what ways do lucid and non-lucid dreams differ? While discussing the relevance of findings on lucid dreaming to dreaming in general, Foulkes asked:

When you change ordinary dreaming by adding a self which intends and reflects, what else changes alongside this change? This is one way of evaluating the role played by the absence of self [-awareness] in ordinary dreaming, and is perhaps the point at which lucid dreaming data could be most relevant to ordinary dream psychology. However, at present there seems to be no systematic data comparing the REM-monitored lucid versus non-lucid dreams of the same dreamer.

Prior to Jayne [Gackenbach]'s presentation, I was prepared to state that no studies have yet compared laboratory-collected lucid versus non-lucid dream content. However, in her presentation Jayne described a content analysis of lucid versus non-lucid dreams of seven to twelve sleep laboratory subjects. Studies such as hers analyzing laboratory-collected dreams can protect us from the dangers of an over-reliance on survey research. Although the survey method does provide a quick and easy way to collect a great deal of data from many subjects, it suffers from poor reliability of delayed dream recall and uncontrolled interpretation of questionnaire items. The survey approach must therefore be complemented by studies examining more reliable dream descriptions from smaller groups of subjects within the sleep lab.

This study utilized a repeated measures single subject design. The subject of this study was a 23-year-old right-handed Caucasian male. He was selected for this study on the basis of his strong interest in dreams and highly detailed dream recall. He had experienced only occasional lucid dreams in the past, the first of which occurred during his childhood.

This individual slept in the sleep laboratory approximately once a week over a period of 28 nights. During the initial 21 laboratory nights, an auditory biofeedback procedure was introduced during his REM sleep. I have reported elsewhere on this individual's development of lucid dreaming, and will concentrate here instead on the

dream content associated with lucid dreaming.

One Dream or Many? The Dream "Scene"

Most previous dream content studies have used the individual REM period as the unit of content analysis. Can we safely assume however that the dream report of a typical REM period represents a single dream? Any one REM report may be composed of several segments which vary greatly in content, making its analysis as a single unit very misleading.

What is conventionally referred to as a "dream" may actually represent several dreams that happen to occur during the same REM period. By most conventional definitions, we experience four or five REM "dreams" each night. However, we may actually experience several times that many in a typical night because each so-called "dream" may actually be composed of several segments. We might expect the various segments occurring in a particular REM period to be related in content because of their temporal proximity. By assuming these segments to be separate entities rather than a single experience we are able to test the degree to which they are truly related.

What criterion best lends itself to subdividing the REM experience into separate segments? Dream reports often include sudden shifts to new locales. Because a change in location generally involves a change in content, the boundaries of a segment may for research purposes be delineated in terms of its physical setting. In these terms, dream experiences bear a resemblance to films in that they are composed of various setting-based *scenes* from several seconds to several minutes in duration. Because of the above delineated practical and logical advantages involved in this method, the setting-based *scene* will be treated like a discrete dream, and has been adopted as the basic unit of analysis in the present study.

Dream Interview

Following awakening from each REM period a tape recorded dream interview was conducted with the subject. The interview began with a period of free recall in which the subject was encouraged to recall any dream material from the preceding REM period. The dream material was then subdivided into individual *scenes* which the subject arranged in order of occurrence. After giving a brief synopsis of each scene, the subject responded to a series of 18 questions on a five-point Likert scale. These addressed a variety of characteristics of each scene including level of physical and cognitive activity, affective intensity, bizarreness, speaking, and quality of recall.

Statistical Analyses

The 18-item dreamer-rated questionnaire data from scenes of the 26 laboratory nights were subjected to various analyses. Several stepwise discriminant analyses were conducted on various subgroups of the questionnaire data. Because the data used in the discriminant analysis are the product of a single subject, the observations are not

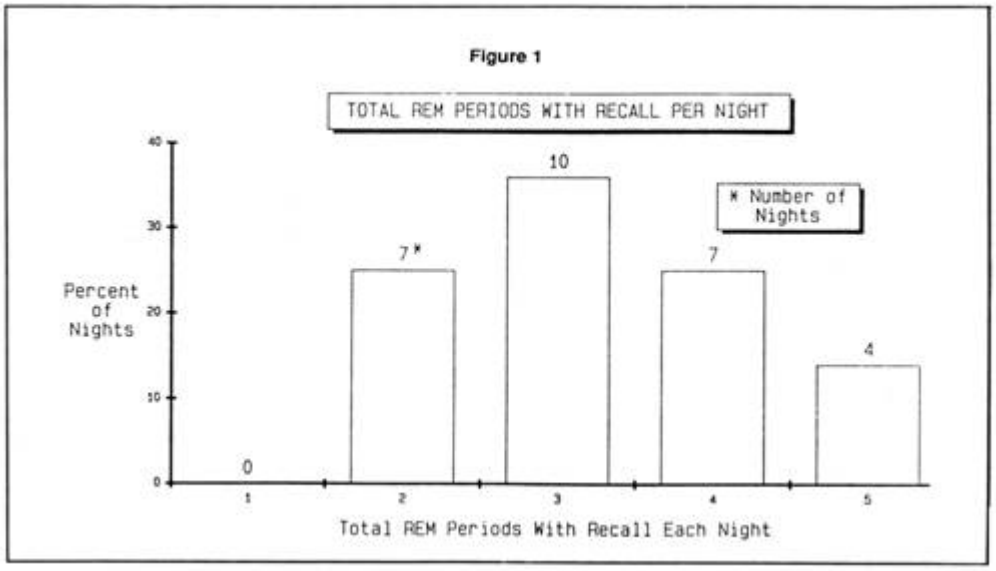
independent. That dependency among observations allows the use of discriminant function analysis for descriptive purposes, but prevents its use to actually test hypotheses. Therefore, this study yields overall classification success rates as compared to change rates but not significance levels.

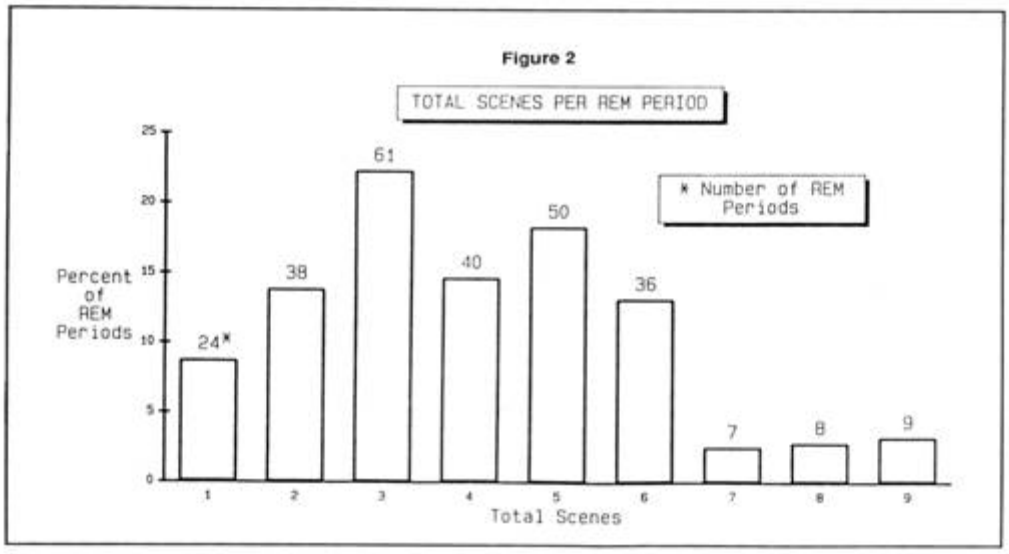
Results and Discussion

During each of the 28 laboratory nights the subject reported dream content from two to five REM periods, the mode (36 percent) being three (Figure 1). The total number of recalled scenes per REM period dream report ranged from one to nine, the mode (22.3 percent) again being three (Figure 2). More than two-thirds of REM reports consisted of between three and six scenes. The total number of recalled scenes per night ranged from 3 to 20, producing a grand total of 274 scenes.

Content Analysis: Lucid Vs. Non-lucid Scenes

Aside from obvious differences in the dreamer's cognitive state and abilities, can we distinguish the content of lucid from non-lucid scenes? If so, how are they different? Which content dimensions best discriminate the two types of scenes?





Out of a total of 92 REM dream reports, the subject reported being lucid during at least part of the REM period for 30 of these (involving 36 lucid scenes). All but two of these lucid experiences were verified by ocular signals on the EEG. For the initial analysis, all 36 lucid scenes were compared with all scenes from REM periods without lucidity.

The discriminant function correctly classified lucid and non-lucid scenes at a rate of 85.2 percent, compared to a 50 percent success rate expected by chance alone. Lucid scenes tend to be rated substantially higher in terms of clarity of recall, bizarreness, positive affect, vividness of imagery, dreamer activity, and control. Non-lucid dreams, on the other hand, tend to be described as more verbal.

The most certain conclusion of the current study is that for this subject at least, lucid and non-lucid dream scenes are indeed radically different experiences.

The lucid dreamer perceives vivid and often bizarre imagery. He experiences intense, generally positive emotions. In fact frequently, his level of positive affect during a lucid dream and even upon awakening from one can only be described as euphoric. His dream-self is quite active physically, and he exercises an elevated degree of problem solving and cognitive control over dream events. Not surprisingly, these intense lucid experiences tend to be better recalled upon awakening than non-lucid ones. In contrast, his lucid scenes tend to be somewhat less verbal than his non-lucid ones.

How then might we answer Foulkes' question: "When you change ordinary dreaming by adding a self which intends and reflects, what else changes alongside this change?" It appears that when the dreamer realizes that his perceptual world is illusory, his experience of it suddenly intensifies perceptually and emotionally as well as cognitively. Knowledge that the dream is unreal makes it seem more vivid. The dreamer's realization that he is not actually experiencing the dream events in waking reality frees him to become more involved in it cognitively, emotionally, and physically.

It may be the sense of detachment gained through self-reflection that frees the

dreamer to participate more fully in the dream. Thus, the dreamer's inner conviction that "This is all a dream", while flying over an unfamiliar landscape fills him with a sense of awe regarding his own creative powers which is balanced by a calm sense of detached observation. A similar experience occurs when we allow ourselves to become terrified during a frightening scene from a horror movie, comforted by the knowledge that "It's only a movie."

Content Analysis: Scenes Within Lucid REM Periods

The use of the scene as a unit of analysis allows a comparison of all scenes from within only those REM periods in which lucidity occurred. All scenes occurring in REM periods containing at least one lucid scene were assigned to one of four categories: (1) *pre-prelucid*: scenes occurring before those which immediately precede lucidity; (2) *pre-lucid*: scenes immediately preceding lucidity onset; (3) *lucid* scenes; and (4) *post-lucid*: scenes following lucid scenes. A distinction was drawn between pre- prelucid and pre-lucid scenes in order to explore dream precursors of lucidity. The small number of scenes immediately following lucidity made this same distinction impractical for post-lucidity; hence, all post-lucid scenes were grouped together. After excluding variables which define lucidity, can we successfully distinguish these four types of scenes?

The discriminant functions correctly classified scenes into the four groups at an overall rate of 73 percent as compared with a chance rate of 25 percent. Several trends are evident within the partially lucid REM period (Figures 4 and 5). Scenes coming before those immediately preceding lucidity are most like scenes from REM periods without lucidity. They do however contain elevated levels of dreamer activity, gaze shifting, negative affect, and vividness. Pre-lucid scenes display slightly elevated levels of positive affect and dreamer activity, and rival lucid scenes in visual vividness and recall clarity. That is where the similarity between pre-lucid and lucid scene content ends however, as speaking and scene movement which are somewhat elevated during pre-lucid scenes decline with the onset of lucidity. Furthermore, pre-lucid levels of negative affect, bizarreness, gaze shifting, attitude inconsistency, control, and problem solving all remain consistent with that of non-lucid REM period scenes. Lucid scenes can generally be easily distinguished from other scenes within their REM period by their extremely elevated levels of positive affect and bizarreness. Finally, post-lucid scenes retain some of the qualities of lucid scenes, particularly in their levels of attitude inconsistency, control, problem solving, vividness, and recall.

Do pre-lucid content characteristics "trigger" lucidity? At least three dream conditions have been suggested to precede a majority of lucid dreams: (1) heightened anxiety or stress; (2) detection of incongruities within the dream; and (3) recognition of a "dream-like" quality. Although these three conditions occasionally appeared to trigger lucidity, many other dreams included heightened anxiety, bizarre incongruities, and dreamlike qualities, yet never became lucid. In fact, raters judged that only twice did lucidity appear to be triggered by incongruous content, and only twice by a frightening situation. As

mentioned above, pre-lucid scenes showed weak elevations on only positive affect and dreamer activity, and rivaled lucid scene levels on only vividness and recall. Thus, the pre-lucid qualities found here, specifically the nonelevated levels of negative affect and bizarreness, offer no clear support for the notion that conditions in dream content such as heightened anxiety or bizarreness trigger lucid awareness.

Figure 3

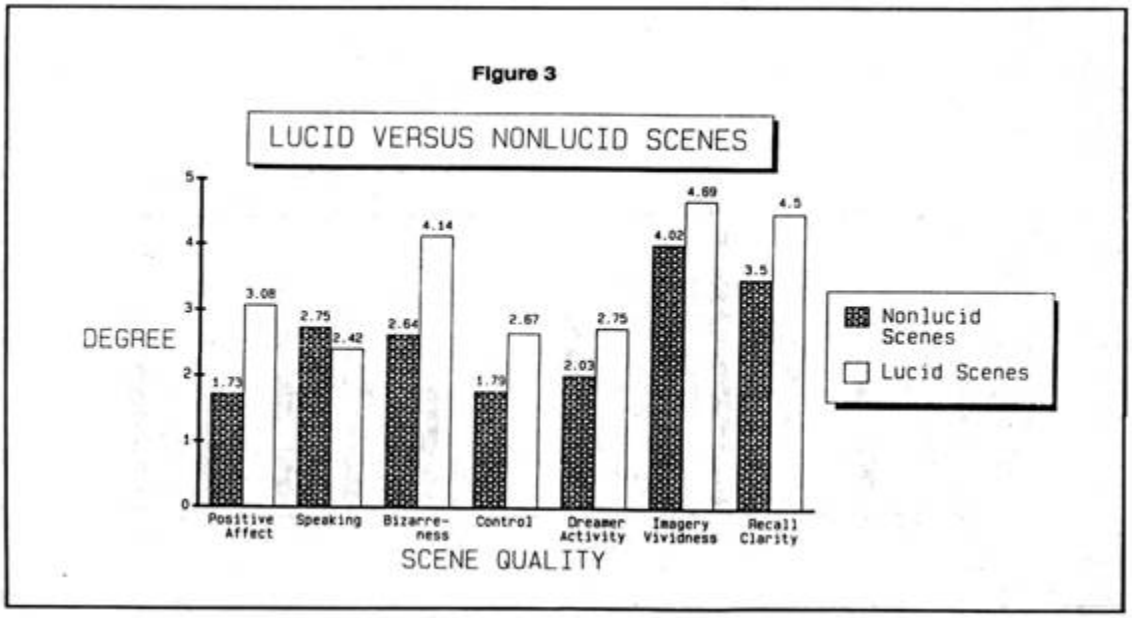
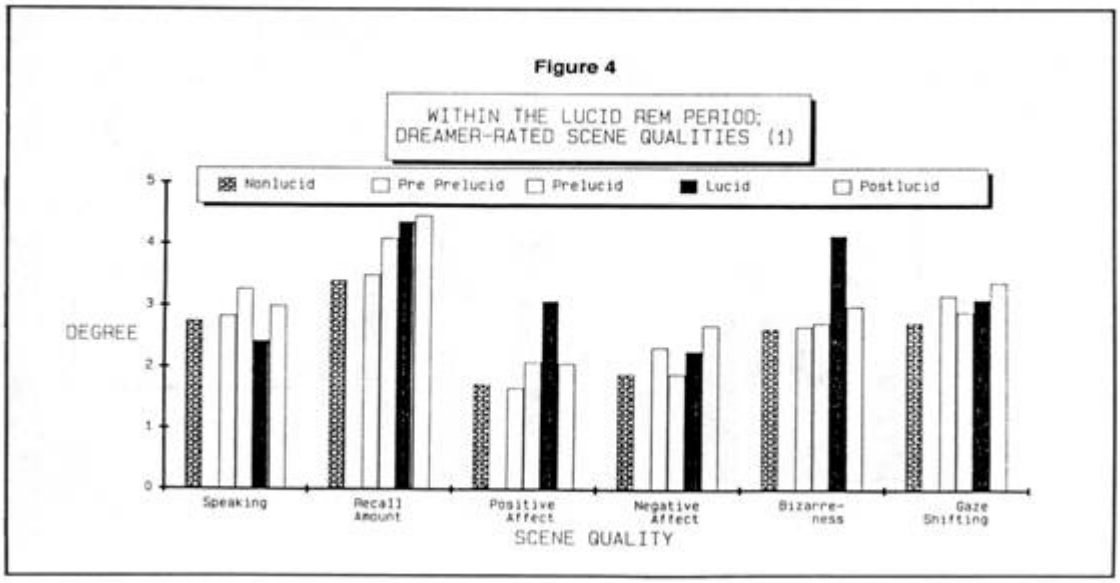
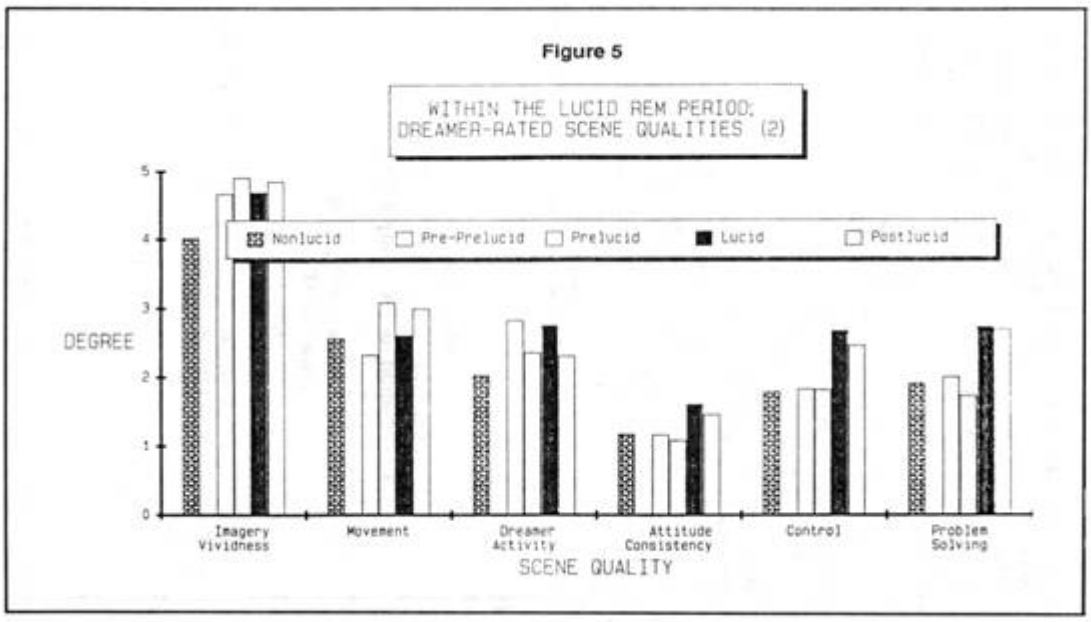


Figure 4





Conclusion

Like previous studies, we found lucid dreaming to be a radically different experience than non-lucid dreaming. When the dreamer recognized his phenomenal realm to be a dream, his experience of it intensified perceptually, cognitively, and emotionally. Not surprisingly, these lucid experiences were recalled with great clarity. Controversy exists over whether lucid dreaming represents a fundamentally different and discontinuous state from ordinary dreaming. While the present study demonstrates widely divergent qualities between the two states, we cannot infer with certainty a discontinuity beyond the emergence of reflective awareness.

The current study has provided a detailed and reliable close-up description of one individual's dream content while developing *lucid-ability*. It is impossible to determine how many of these findings are unique or can be generalized to all dreamers. In order to answer this question, the dreams of many additional subjects must be subjected to the same kind of scrutiny as those presented here.