Psychophysiological Parallelism in Lucid Dreams

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The nature of the relationship between the mental and physical worlds has long intrigued the philosophers among us. This, the so—called "mind—body problem," is really many problems—or else a single question that takes many forms. Among these is whether and how the subjective (mental) events of the dream and the objective (physical) events occurring in the dreamer's brain are connected. Happily, the solution to this formerly intractible problem now appears to be within reach due to a recent methodological innovation in dream research, based on the phenomenon of lucid dreaming (i.e., dreaming while knowing that one is dreaming). This new approach is made possible by the fact that lucid dreamers can remember to perform predetermined actions and signal to the laboratory while still in their dreams (1). These specially trained observers (2) are able to mark the exact time of particular dream events while carrying out diverse experimental tasks, thus allowing the methodical testing of hypothese and the precise determination of psychophysiological relationships. Five of our studies, summarized below, illustrate this strategy.

Correspondence between dreamed and actual eye movements. We have found that there is a very high degree of correlation between the direction of gaze shift reported in lucid dreams and polygraphically recorded eye movement. We make routine use of signals in all of our experiments. In addition, we have found evidence suggesting two independent sources of REM activity and dream content (i.e., brainstem and forebrain).

Dream time. How long do dreams last? We were able to address this hoary question in such a way as to receive a direct answer, by simply asking lucid dreamers to estimate various intervals of time while dreaming. Signals marking the beginning and end of the intervals allowed comparison with objective time. In all cases, time estimates during the lucid dreams were very close to actual dream time.

Voluntary control of respiration during lucid dreaming (3). We recorded three lucid dreamers who were asked to either breathe rapidly or to hold their breath (in their lucid dreams), marking the interval of altered respiration with eye movement signals. They reported successfully carrying out the agreed—upon tasks a total of nine times. In every case, a judge was able to correctly predict on the basis of the recording which of the two patterns were executed ($p<.002$).

Singing and counting during lucid dreams (4). Integrated alpha activity was derived from right and left temporal EEG while four subjects sang and counted in their lucid dreams. The results indicated task dependent lateralization of alpha activity: the right hemisphere

was more activated than the left during singing; during counting, the reverse was true. These shifts were similar to those observed during actual singing and counting.

Physiological responses to lucid dream sex (5). A pilot study with two lucid dreamers (one male and one female) who reported sexual arousal and orgasm in their (separate!) lucid dreams revealed patterns of physiological activity closely resembling those accompanying corresponding experiences in the waking state.

All of these results are in unanimous accord with the conclusion that the events a person experiences while asleep and dreaming produce effects on his brain (and to a lesser extent, body) remarkably similar to those that would be produced if the person were to actually experience the corresponding events while awake. As for the "mind—body" problem posed at the beginning of this paper, the question was how the (psychological) occurrences of the dream are related to physiological events in the dreamer's brain. In the light of the studies reviewed above, a partial answer can be given by saying that dream events are closely paralled by brain events. If this picture of psycho-physiological parallelism is valid, it could provide an explanation of why dreams seem so real while they last: it is because to our brains, dreaming of doing something is equivalent to actually doing it.

References

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