Non-REM Lucid Dreaming

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As with Pierre and others, I'm not going to try to present a lot of the details of our study, nor defend what I think is probably the most unique and therefore most valuable aspects of the study I'll be talking about. I've spoken elsewhere (Dane, 1984) about the general background of the full three years of study that we did on lucid dreamers, first with frequent lucid dreamers, and then with non-lucid dreamers. What I want to focus on today are the findings relevant to non-REM lucid dreaming in the non-lucid dreamer population that we used. So I'm going to briefly describe the study itself and focus on the non-REM results. I don't want to put myself in the position, today, of having to defend the existence or non-existence of non-REM lucid dreams, so let's just assume today that it's an existing phenomenon, at least in the early stages of non-REM sleep, and see what the implications are. I'll point out as I get to that point in the presentation where I think Stephen LaBerge has some good points, not necessarily objec-tions, but alterations, things that need to be checked further with respect to non-REM lucid dreaming.

Basically, we used the same format Stephen had used in terms of trying to give a signal. Figure 1 is an example of the "squaretop wave" eye signal we used. This example is obviously from the waking state.

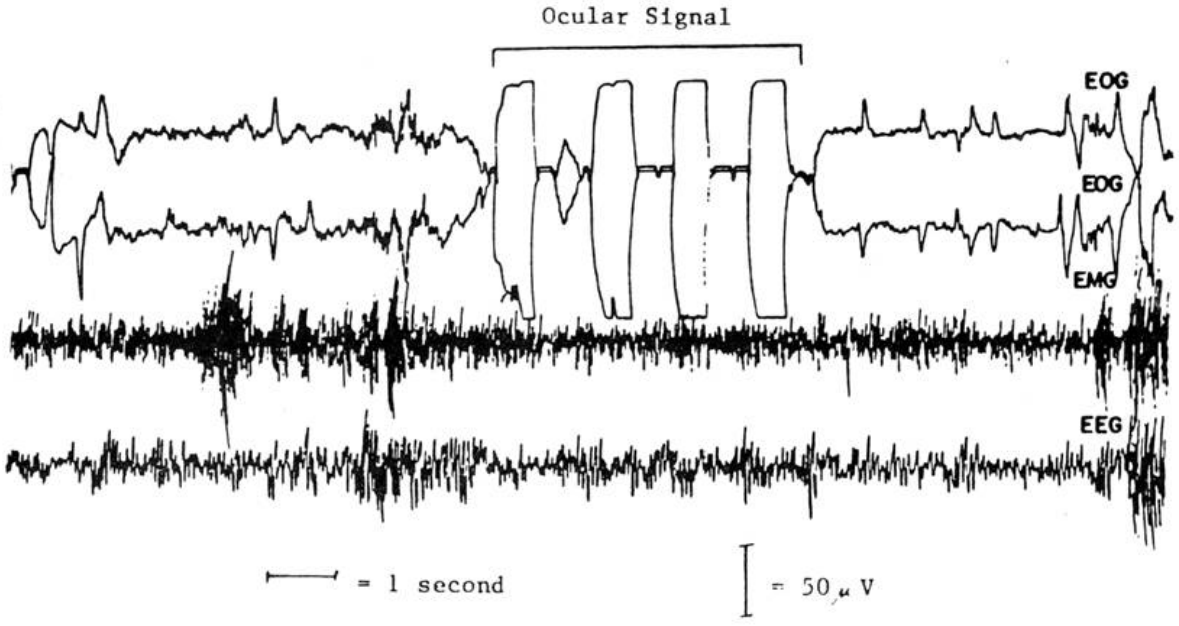

Figure 1. Example of Ocular Signal while awake

We decided that it would make more sense to use a more complex signal since we felt that the one Stephen was originally using was too easily confused with random eye movements. I should note that the multiple up and down movements which he now uses are obviously quite easily distinguishable. In any event, Figure 2 is an example of our signal in normal REM sleep, and of how clear it can be. Note that it stands out quite well.

The part of the study I'm going to talk about now involved 30 non-lucid females who had all been evaluated for hypnotic susceptibility using the Stanford Hypnotic Susceptibility Scale, Form C. They all scored 5 or better, that is, in the upper fiftieth percentile of hypnotic susceptibility. The goal was to see whether, in one night in the lab, it's possible to elicit verifiable lucid dreams in these formerly non-lucid dreamers. We used only females because of the apparent difference in frequency of lucidity in males versus females, and we wanted to avoid contaminating variables. Incidentally, these subjects all reported spontaneous recall of one or more (normal) dreams per month at baseline.

There were essentially four treatment conditions (see Table 1). Basically, we were comparing, a) waking

Table 1
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Number of Subjects
Per Experimental Condition

Condition A	Condition B
(OWI)	(OWI + PHS)
N=8	N=8
Condition C	Condition D
(RWI)	(RWI + PHS)
N=7	N=7

instructions (WI) versus b) waking instructions (P115) plus posthypnotic suggestion. And there were two kinds of waking instructions, original (OWI) and revised (RWI). Let's look at condition A (OWI) to start out with the simplest condition. The original waking instructions were, "signal when you think you are dreaming." There were also other things to do, but for time's sake, that's the basics. The revised waking instructions were, 1) "signal whenever you think you're asleep," then, as opposed to asleep and dreaming, 2) "signal only when you're asleep and experiencing any kind of imagery," and finally 3) "signal only when you're asleep and sure you're dreaming." It's important to realize that after each time they signaled they were wakened and we talked about their experience.

What we found was that the original waking instruc-tions didn't work, as I'll show you in a bit. But what's significant is that the revised waking instruc-tions worked

because we broke them down into smaller, more manageable increments and gave feedback with each increment.

Now, in the hypnosis condition, everybody had gotten the waking instructions, then they were given the hypnotic inductions and they were asked to have an encounter with a dream symbol. I'm not going to go into the details about that dream symbol now. Basically, a symbol was developed based on the hyp-notic dream about hypnosis that the subject had had during the assessment of hypnotic susceptability. In addition, the hypnotic state reinforced the waking instructions.

So on the first line of Table 1 you've got the original waking instructions, Condition A (N = 8), versus the original waking instructions plus PHS, Condition B (N = 8), and on the second line, the revised waking instruction, Condition C (N = 7), versus the revised waking instruction plus PHS, or Condition D (N = 7). Keep these in mind as we're going to come back to this grid.

With respect to the kinds of lucid dream reports we got, there were three types. The first was unam-biguous REM or UREM lucid dreams. This is the type that primarily LaBerge and others have referred to. Incidentally, I think Hunt and his group would tend to agree with us that, at this point in the development of lucid dream research, we no longer have to prove that lucid dreaming really does occur during unambiguous REM sleep. What we now need to start looking at is what happens without the encumbrance of having to signal during the dream to "prove" that we are having a lucid dream, since the act of signaling may, in some instances, alter the quality or content of the dream in an artificial manner. So for the definition of lucidity in this study, we were willing to accept a second type of lucid dream report, called the am-biguous REM or AREM lucid dream. This is where it is reasonable to assume that the lucid dream occurred during unambiguous REM, but, consistent with the subject's report, the attempt to signal wakened the dreamer, and the signal only occurred immediately after arousal, from REM. So later, when I talk about "REM-associated" lucid dreams, I'm talking about both UREM and AREM lucid dreams. And finally, of course, there were non-REM or NREM lucid dreams. Okay, so there were three classifications: UREM, AREM and NREM lucid dream reports.

Now in Table 2 you can see that the number of subjects who reported one or more (and it was typically more) of these types of lucid dreams is about the same in each of the conditions, other than in the original waking instruction condition, or Condition A. In other words, what we ended up with was three effective induction techniques. The effect remains significant even if you exclude the NREMLD reports. I want to emphasize that we're not talking about dreamlets. We're not just talking about merely brief imagery. We're talking about real lucid dreams.

Table 2

Number of Each Type of Lucid Dream Reported By Subjects in Each Condition

Subject	UREM	AREM	NREM	Subject	UREM	AREM	NREM
Condition A (OWI)				Condition B (OWI + PHS)			
1A				1B		1	2
2A				2B			2
3A			3	3B	1		
4A				4B	1		
5A				5B		2	4
6A				6B		1	1
7A				7B			
8A				8B	1		
Total			3		3	4	9
Condition C (RWI)				Condition D (RWI + PHS)			
1C	1		1	1D	1		2
2C				2D	1	1	1
3C	1	1	1	3D			2
4C			1	4D		2	
5C		1	1	5D			2
6C		1	2	6D			1
7C	1			7D			1
Total	3	3	6		2	3	12

Okay, now Table 2 is complicated, but what we've got are four conditions and the kind of lucid dreams that each subject reported. There are basically four cells. For example, subject lB had one ambiguous REM lucid dream, and two non-REM lucid dreams. So within Condition A, (PHS plus the original waking instructions), there were three unambiguous REM lucid dreams in three subjects, there were four AREMLDS in three subjects, nine NREMLDs in four subjects, and so on for each group. Again, you can see that even though the original waking instructions (condition A) had some effect, there

was only one subject in the original waking instruction condition that reported any lucidity, and this was all during non-REM.

I'll come back to this table. With respect to the physiology, we divided the NREMLDs into five basic types, based on Foulkes and Vogel's (1965) work with non-REM dream reports. Consistent with their system (see Table 3), the kinds of non-REM lucid dream reports we had were alpha REM, or alpha with rapid eye movements; alpha REM/SEM, or alpha with a mixture of rapid and slow eye movements; alpha SEM, stage one, and stage two. The percentages in parentheses are the percentages of dream reports noted by Foulkes and Vogel in wakings from these various stages of sleep. This is simply to remind you that "real" dreaming really does occur in these stages, whether lucid or not. Real dreaming does occur during non-REM sleep.

I want to emphasize some basic points. One has to do with the duration of lucidity. There were three classifications of length or duration of lucidity. The evidence for duration was the subjective report of duration along with numerous instances of multiple signals. We told subjects, as did Stephen, that they were to signal every minute to a minute and a half for as long as they were lucid. If they didn't signal within at least two minutes, they were awakened. The subjects were motivated to continue signaling. So, there were three types of lucid dream endurance: brief, recurrent, and enduring. The recurrent type is where the subject became lucid, lost lucidity for a time, and subsequently became lucid again, all within the same dream. This seems to have occurred only in the REM-associated lucid dreams. In the NREMLDs, they had only brief versus enduring types.

Table 3

Physiological Classification of NREMLSs

Alpha REM	(31%)*
Alpha REM/SEM	
Alpha SEM	(43%)
Stage 1	(76%)
Stage 2	(71%)

*Percentages are of true 'dream' reports noted by Foulkes & Vogel, 1965.

This next table (see Table 14) indicates the duration of NREMLDs only. What's interesting to note in this slide is that, the sleepier, or less aroused the sub-jects became, the briefer the lucid dreams became. In sleep onset, you tend to get more enduring than brief.

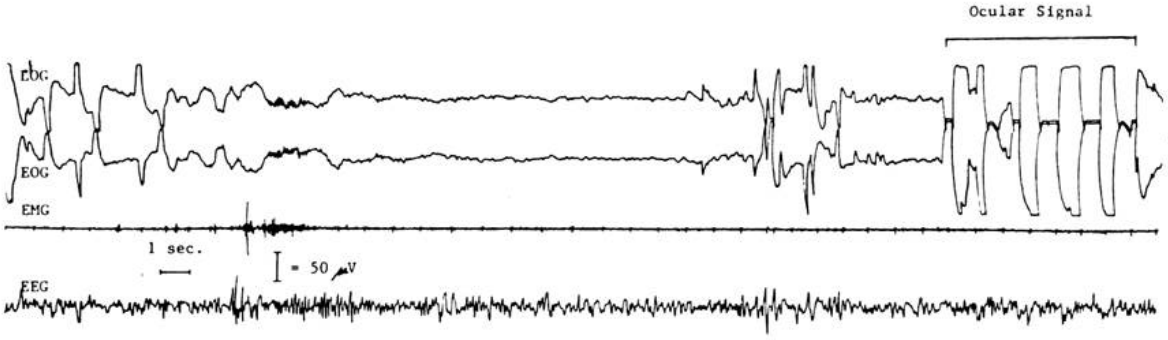

Figure 2. Example of Ocular Signal during unambiguous REM sleep

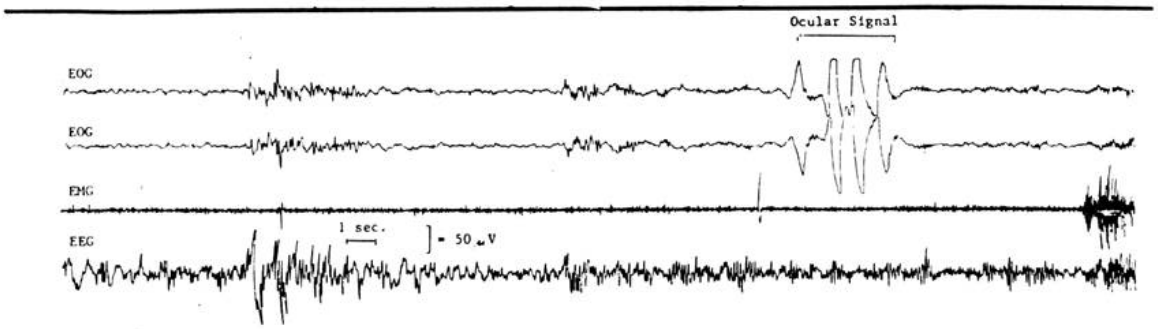

Figure 3. Example of Ocular Signal from Ascending Stage 2 Lucid Dream

Toward Stage 2, you get four times as many brief as enduring. Now we also found that of the five stage two examples we had, no one was able to signal before waking. This is also what Stephen found with his apparent Stage 2 lucid dreams in his dissertation report. So we wonder whether this means that Stage 2 sleep represents some kind of narrow threshold state which is inconsistent maybe with both lucidity and signaling, but at least with sustained lucidity and signaling. I'm not sure which.

Here are a few examples. Figure 3 is from Stage 2. You can see the K-complex to the left, and the lucid dream signal. You can also see the beginning of arousal, before the signal, but it's nice Stage 2 up to that point. It would have been tempting to inter-pret this polygraph record as if the subject were still asleep, but it's this kind of thing (i.e., some form of arousal) that we got each time in Stage 2. Let me show you a further example in Figure 4. Here is a stage one lucid dream. A real distinct EEG with real slow, pendular eye movement, and a good clear signal. The final figure (see Figure 5) is an alpha slow eye movement lucid dream.

When scoring NREMLDs, it's very difficult to determine exactly when and whether a person is "awake" or "asleep," especially during these alpha types. How does one talk about 'arousal' when alpha is already defined as arousal in more traditional terms? Clearly, as Foulkes and Vogel demonstrated, there is strong individual variability in the exact physiological condition during which one person is aroused and another is still "asleep" and possibly dreaming during sleep onset or the stages of light sleep. Our way of looking at it is that the dream occurs within the context of an ongoing background of physiological phenomena, and if no significant change in this back-ground is noted, and the subject reports that the dream continued, then it is reasonable to say that the subject was "asleep and dreaming," as in the instances reported here where they were dreaming lucidly.

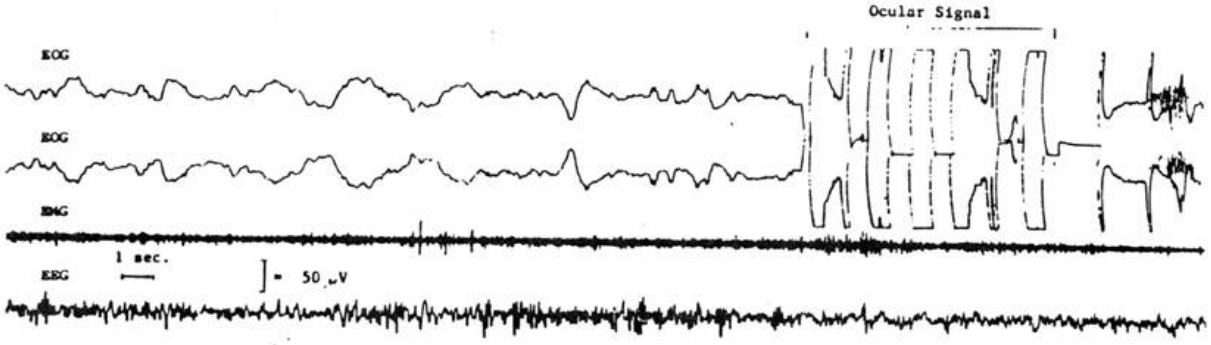

Figure 4. Example of Ocular Signal during Stage 1 Lucid Dream

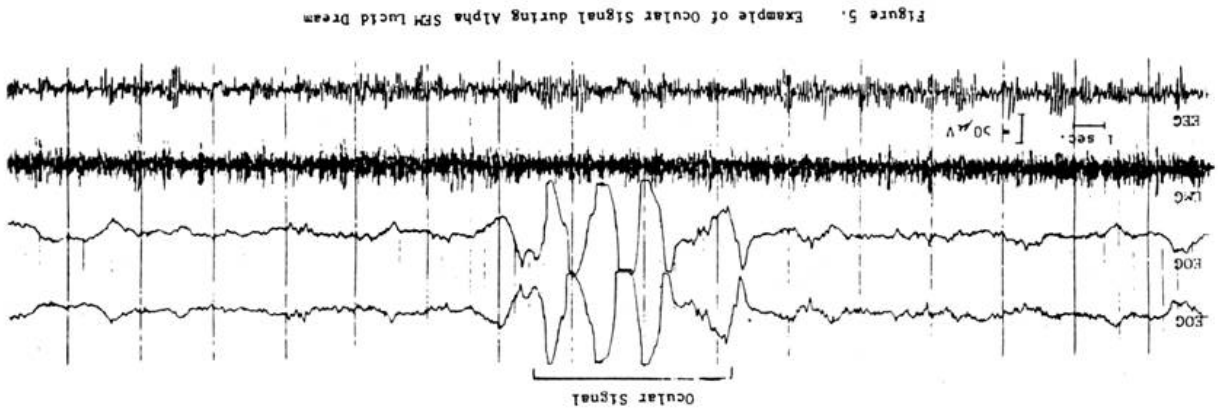

Figure 5. Example of Ocular Signal during Alpha SEM Lucid Dream

I'd like to make a couple of other points. If you look at the results in terms of hypnotic versus waking experimental conditions, it's interesting to note that virtually all of the REM-associated lucid dreams which occurred in the "waking instructions only" conditions, or Conditions A and C, occurred in the third REM period or earlier. None occurred after the third REM period, even though the subjects in the waking condi-tions had greater access to more than three REM periods per subject than did the subjects in the hypnosis-associated conditions (Conditions B and D).

Finally, let's say for argument's sake that since the original waking instructions didn't work, PHS plus the original waking instructions (Condition B) really represents the effects of pure posthypnotic sugges-tion, more or less (see Table 2). Then the conditions B and C, where you've got pure hypnosis and pure waking instructions, you get about the same propor-tions of NREM versus REM-associated lucid dreams; 9 versus 7, 6 versus 6. But if you combine successful waking instructions with hypnosis, you get twice as many NREM lucid dreams as you get REM-associated lucid dreams. This may be because the suggestions in the hypnosis condition reinforce the waking instructions, which themselves focus the subject on sleep onset phenomena, so you're really boosting that focus at sleep onset.

References

Dane, J. (1984). *A comparison of waking instructions and post hypnotic suggestion for lucid dream induction*. Unpublished doctoral dissertation, Georgia State University.
Foulkes, D., & Vogel, G. (1965). Mental activity at sleep onset. *Journal of Abnormal Psychology*, 7, 231-243.