**Proceedings from the Second Annual Lucid Dreaming Symposium**
**Session 1: What is a Lucid Dream: Psychological and Physiological Considerations**

# Manifest Content Analysis of Sleep Laboratory Collected Lucid and Nonlucid Dreams

**Jayne Gackenbach**
***University of Northern Iowa***

I have addressed two questions over the last 10 years in my research program into lucid dreams: who is the individual who spontaneously experiences the lucid dream, that is to find out if there is something unique about that person, and what is the psychological experience of sleep consciousness which is unique beyond the awareness itself. I'm going to be talking about the latter today. Specifically, I'm going to be comparing sleep laboratory collected rapid eye movement lucid and non-lucid dreams.

In these content analyses we used Hall and Van de Castle's (1966) system of analysis of the manifest content of the dream focusing on a count of the act frequencies. We basically counted the number of elements. This is a simple kind of conceptualization of the psychological content of dreams but one we have used in the past because it allows comparison to normative samples and can be simplified for computer entry of the data. With this first look at the content of these dream experiences we can compare the data to both the classical literature on the psychological content of dreams as well as to the previous content analyses of questionnaire and dream diary collected lucid versus nonlucid dreams (Gackenbach, in press).

The lucid dreams analyzed here are signal verified, that is with judge, technician and dreamer concurrence. For those of you who might not be familiar with the phrase "signal verified" it means that the subjects signaled from rapid eye movement sleep with a pre-arranged set of eye movements when they knew they were dreaming. Sleep laboratory technicians "read" the signal which was further verified by a concurrent report from the dreamer and examination of the record by an independent judge.

Table 1 lists the specifics of these two samples of dreams which were collected from three different sleep laboratories, although the majority of them are from the laboratory of my colleague Stephen LaBerge. These 50 dreams are all from the REM sleep of twelve individuals. The nonlucid dreams are collected from two sleep laboratories, the majority from a sleep laboratory study we conducted in Iowa. These 28 nonlucid dreams are also all from REM sleep. They are provided from seven people, all but one of whom had experienced dream lucidity. The major procedural qualifier that I would like to bring to your attention is that the majority of the nonlucid dreams were collected from lucid

dreamers. We have preliminary indications from dream diary data that lucid and nonlucid dreamers may dream somewhat differently while nonlucid in sleep.

**Table 1**
**Characteristics of Laboratory Collected Lucid Versus Nonlucid Dreams**

| |
|---|
| **Lucid Dreams** |
| All signal verified with judge, technician and dreamer concurrence |
| Collected in three different sleep laboratories (majority from LaBerge) |
| All from REM sleep |
| Provided from 12 individuals |
| 50 lucid dreams analyzed |
| **Nonlucid Dreams** |
| Collected from two different sleep laboratories (majority from Gackenbach) |
| All from REM sleep |
| Provided from 7 individuals (all but 1 had experienced dream lucidity) |
| 28 nonlucid dreams analyzed |

We computed 135 analyses of covariance with the number of words in the dream transcript as the covariate. Word count is thought to provide a rough estimate of dream recall but of course it is contaminated by verbal skills. However, because of the consistent superiority of recalling lucid versus nonlucid dreams (Gackenbach, in press; Snyder & Gackenbach, in press) one should always control for dream recall differences. For those of you who are not familiar with the Hall and Van de Castle system of dream content analyses I shall briefly summarize each of the scales before talking about our findings. The significant and conceptually interesting findings are summarized in Table 2.

Results

Hall and Van de Castle list five emotions which are looked for as expressed in dream transcripts: anger, apprehension, happiness, sadness and confusion. There were no differences between lucid and non-lucid dreams. This is somewhat surprising given the popular conceptualization of lucid dreams as joyful. In fact, we have data from self reports of emotions during lucid and nonlucid dreams which support this joyful aspect of lucidity (Gackenbach, 1978; in press) What this finding points out is that the degree of joyfulness may be in the eye of the beholder, in this case the dreamer, which is not necessarily communicated vis-a-vie the written description of the dream.

Next are the four types of character scales identified by Hall and Van de Castle: number, sex, age and identity (see Table 3 for details of each character subscale). You can see in Table 2 that for most of the character subscales there were no dream type differences but that where there was a difference lucid dreams had fewer characters. This is consistent with previous analyses on non-laboratory collected lucid versus non-lucid dreams (Gackenbach, in press).

**Table 2**
**Adjusted Means & F-Ratios of Manifest Content for Rem Sleep Laboratory Collected Lucid and Nonlucid Dreams**

| Subscales | Adjusted Means: Lucid (50) | Adjusted Means: Nonlucid (28) | F-Ratios |
|---|---|---|---|
| Word Count | 171.92 | 56.25 | F(1,76)= 13.53, p<.0001 |
| Achievement: | | | |
| Success | 1.47 | 0.49 | F(1,75)= 10.97, p<.001 |
| Achievement Total | 2.14 | 1.03 | F(1,75)= 9.42, p<.003 |
| Elements: | | | |
| Positive Modifiers | 2.31 | 1.72 | F(1,75)= 2.48, p<.12 |
| Negative Modifiers | 1.75 | 0.91 | F(1,75)= 8.76, p<.004 |
| Chromatic | 0.15 | 0.42 | F(1,75)= 4.15, p<.045 |
| Old | 0.06 | 0.18 | F(1,75)= 2.65, p<.108 |
| Young | 0.08 | 0.20 | F(1,75)= 2.78, p<.10 |
| Event Date | 0.06 | 0.22 | F(1,75)= 2.98, p<.089 |
| Bizarreness: | | | |
| Inappropriate Item | 0.02 | 0.10 | F(1,75)= 3.11, p<.082 |
| Magic | 0.41 | 0.00 | F(1,75)= 4.81, p<.031 |
| Animate Sum | 1.09 | 0.45 | F(1,75)= 4.65, p<.034 |
| Violate Physical Law | 0.18 | 0.02 | F(1,75)= 2.95, p<.09 |
| Transformation Sum | 0.69 | 0.27 | F(1,75)= 3.66, p<.06 |

**Table 2 (continued)**
**Adjusted Means & F-Ratios of Manifest Content for Rem Sleep Laboratory Collected Dreams**

| Subscales | Lucid (50) | Nonlucid (28) | F-Ratios |
|---|---|---|---|
| Activities: | | | |
| Physical (Still) | 3.68 | 1.68 | F(1,75)=18.77, p<.0001 |
| Location Change | 0.72 | 1.26 | F(1,75)= 3.28, p<.074 |
| Social Interactions: | | | |
| Friendly Assistance | 0.26 | 0.54 | F(1,75)= 3.23, p<.076 |
| Covert Aggression | 0.01 | 0.15 | F(1,75)= 5.43, p<.022 |
| Characters: | | | |
| Female | 0.57 | 1.44 | F(1,75)= 10.58, p<.002 |
| Joint Sex | 0.10 | 0.63 | F(1,75)= 8.85, p<.004 |
| Total Sex | 2.43 | 3.59 | F(1,75)= 6.17, p<.015 |
| Adult | 1.65 | 2.51 | F(1,75)= 8.12, p<.006 |
| Total Age | 1.71 | 2.66 | F(1,75)= 9.47, p<.003 |
| Brother | 0.01 | 0.20 | F(1,75)= 6.02, p<.016 |
| Known | 0.28 | 0.78 | F(1,75)= 6.99, p<.01 |
| Miscellaneous | | | |
| Control | 6.25 | 1.21 | F(1,75)= 17.55, p<.016 |
| Balance | 5.46 | 2.24 | F(1,75)= 10.23, p<.002 |

1. Range of these scales is 1 to 10 with high numbers representing a lot of the characteristic.

The next set of scales are achievement and environmental press, where achievement is

scored for success, failure and total achievement while environmental press is scored for, misfortune, falling, threat, accident, injury, death and good fortune. As can be seen in Table 2 there were two differences with regards to achievement, more success and total achievement imagery in lucid than in non-lucid dreams. Again, with regards with success, this is consistent with the non-laboratory or home dream diary collected lucid dreams which also tended to have more success imagery.

Next let's look at the activities subscales which include: physical activities while being still, movement by the self, and location change, as well as verbal, expressive, visual, auditory and thinking activities. Here we found a difference favoring lucid dreams (see Table 2) in physical (still) which I think is largely accounted for by the task. You've got to move your eyes in order to have a signal verified lucid dream! Usually there is some reference in the dream transcript to the signaling procedure which would be scored as physical (still). Interestingly this is consistent with the non-laboratory lucid dreams where the demand characteristic was not present. Probably the magnitude of the difference is accounted for by the demand characteristic but not the entire finding. With regards to location change, which was also consistent with the non-laboratory data, there was a small and marginally significant difference favoring non-lucid dreams. However, in the non-laboratory dreams we also found differences for auditory and cognitive activities. That is, lucid dreams collected from home diaries and from questionnaires showed more cognitive and auditory kinds of activities than nonlucid dreams. This failure to emerge in the laboratory dreams is problematic as these findings have been some of the most robust to date (Gackenbach, in press). Perhaps the absence of a large enough sample of nonlucid dreams from nonlucid dreamers accounts for this lack of a difference.

**Table 3**
**Dream Characters Subscales**

**Number:** Single, Group, Single Dead, Group Dead, Single Imaginary, Group Imaginary, Metamorphosis of Original, Change

**Sex:** Male, Female, Joint, Indefinite, Total Sex

**Age:** Adult, Teen, Child, Baby, Total Age

**Identity:** Dreamer, Father, Mother, Parents, Brother, Sister, Husband, Wife, Son, Daughter, Child, Infant, Family Member, Other Relative, Known, Prominent, Occupational Identity, Ethnic, Stranger, Uncer-

In Table 4 we have a series of social interactions: sexual, friendly and aggressive. Let me point out that for the aggression subscales I summarized what I considered to be the relatively physical range, not all physical but more aggressive, and the relatively less physical range, into two sum scores. We found two dream type differences: friendly assistance and covert aggression were higher in nonlucid than in lucid dreams. If you don't have many people in a dream you are less likely to get interactions of any kind. I would like to bring your attention to the lack of a difference in the sexual activities subscales. Contrary to what has been proposed by a few individual lucid dreamers as characteristic of lucid dreams in general (Garfield, 1974; LaBerge, 1985) in this sample of laboratory dreams and in the dream diary and questionnaire data we found no differences in sexuality (Gackenbach, in press). Further, in personal communication with Paul Tholey, who has been working with dream lucidity for 30 years, he concurs that sexuality is not naturally inherent to dream lucidity. This isn't to say that it isn't possible it's just not a knee jerk reaction to dream consciousness.

**Table 4**
**Dream Social Interactions Subscales**

| | |
|---|---|
| **Sexual:** | Intercourse, Petting, Kissing, Sexual Overtones, Sexual Thoughts, Total Sexual |
| **Friendly:** | Marriage, Physical Contact, Share Activity, Assistance, Gift, Verbal, Covert, Total Friendly |
| **Aggressive:** | "Physical" Aggression Sum, Nonphysical Aggression Sum, Murder, Physical Harm, Chased, Theft, Accusation, Reject, Verbal, Covert |

Table 5 lists the dream element subscales for which we totaled positive modifiers and negative modifiers for two further subscales. Also found here are references to time as well as the number of negative and positive words in the dream. We found lucid dreams had significantly more positive modifiers. This is certainly consistent with the notion that lucid dreams are experientially more joyful dream experiences. However, these findings are inconsistent with the non-laboratory data where nonlucid dreams were found to be more achromatic than lucid dreams. These findings are complex and perhaps are best conceptualized in the context that most of the elements subscales failed to evidence a dream type difference. Finally, I have listed three marginally significant findings with regards to time. Lucid dreams from this sample of laboratory dreams had fewer old, young and event date references than nonlucid dreams. These findings are consistent and support the commonly held notion of the felt timelessness of the lucid dream experience.

**Table 5**
**Dream Elements Subscales**

**Total Positive Modifiers**
**Total Negative Modifiers**

**Types of Modifiers:** Chromatic, Achromatic, Large, Small, Old, Young, Full, Empty, Hot, Cold, Fast, Slow, Straight, Crooked, Strong, Weak, Pleasing, Unpleasing

**Specific Time**
**Event Date**

**Negative Words**
**Positive Words**

Let's consider dream bizarreness next. There are four basic conceptual ways in which we have looked at bizarreness: Animate Characters, Inanimate Environment, Transformations, and Metamorphoses (see Table 5 for the details of the subscales for each). You can see in Table 2 that three of the subscales from Animate Characters, one from Inanimate Environment and one from Transformations approached or reached conventional levels of significance. In terms of the magic subscale (i.e., impossible acts or magic by animate characters such as animals or babies talking or people flying) from Animate Characters we found a difference that was consistent with the non-laboratory findings as well as for the Transformation sum score. However, for the most part we found no bizarreness difference as a function of dream type.

**Table 6**
**Dream Bizarreness Subscales**

**Animate Characters:** Monsters/aliens, Fictional Characters, Inappropriate Item, Distortion of Body, Magic, Wrong Role, Animate Characters Sum

**Inanimate Environment:** Violate Physical Laws, Misplace Object, Environmental Feature Wrong, Inanimate Sum

**Transformations:** Object Appears/disappears, Time Change, People appear/disappear, Environmental Changes, Transformation Sum

**Metamorphoses:** Person Changes to Another Person, Animal Changes to a Person or Visa Versa, Inanimate Changes to Animate or Visa Versa, Object Changes to Object, Metamorphoses Sum

Finally, I am going to speak about three scales which I find particularly interesting and are not part of the Hall and Van de Castle system: palpable or body sensations, control of

dream content and emotional, physical and cognitive balance. In this sample of dreams we found that there was more dream control in lucid dreams, which is consistent with self report and dream diary non-laboratory dreams. Despite the sensitive issues surrounding dream control while lucid individuals reliably report being able to evidence this dream characteristic. There was also more balance in lucid than in nonlucid dreams. This is a characteristic of dream lucidity I initially identified in factor analyses of lucid dream content in my dissertation (Gackenbach, 1978) and have since shown is an individual difference variable related to the ability to dream lucidly (Gackenbach, Snyder, Rokes, & Sachau, 1986).

**Table7: Laboratory and Home Diary Collected Self Evaluations of Dream Content**

| Dream Groups | TM Subject Lucid Dreams | Lucid Subject Lucid Dreams | Lucid Subject Nonlucid Dreams | Nonlucid Subject Nonlucid Dreams | F-Ratios |
|---|---|---|---|---|---|
| Number of Dreams | 35 | 40 | 50 | 58 | |
| Recall | $6.60_a$ | $5.95_b$ | $5.06_c$ | $4.09_d$ | F(3,179)= 2.51, p<.0001 |
| Visual* | $2.08_b$ | $2.77_a$ | $2.68_a$ | $2.62_a$ | F(3,164)= 7.06, p<.0001 |
| Color* | $1.88_a$ | $2.20_{a,b}$ | $2.34_{b,c}$ | $2.46_c$ | F(3,164)= 2.64, p<.05 |
| Positive Emotion* | $0.88_a$ | $2.07_c$ | $1.52_b$ | $1.48_b$ | F(3,164)=17.94, p<.0001 |
| Negative Emotion* | $1.06_c$ | $2.12_a$ | $1.95_a$ | $1.71_b$ | F(3,164)=11.93, p<.0001 |
| Sounds* | $1.67_b$ | $2.22_a$ | $1.87_b$ | $1.85_b$ | F(3,164)= 2.74, p<.045 |
| Voices* | $1.46_a$ | $2.21_b$ | $2.02_b$ | $2.02_b$ | F(3,169)= 6.44, p<.0001 |
| Palpable Sensations* | $1.15_c$ | $2.09_a$ | $1.78_b$ | $1.75_b$ | F(3,169)= 8.66, p<.0001 |
| Bizarreness* | $1.33_c$ | $1.99_a$ | $2.17_a$ | $1.71_b$ | F(3,169)=10.22, p<.0001 |
| Control* | $2.64_a$ | $2.04_b$ | $1.24_c$ | $1.09_c$ | F(3,169)=76.09, p<.0001 |
| Novelty | $3.28_c$ | $4.85_a$ | $4.91_a$ | $3.85_b$ | F(3,110)= 6.01, p<.001 |

Analyses of Covariance were computed on all content categories with self reported recall as the covariate. Dreams were collected from one TM subject, two lucid dreamers who were unable to signal during two nights in the sleep laboratory and one nonlucid dreamer from both the sleep laboratory and a 20 week at home dream diary. Subscripts indicate the results of the Duncan a-postori tests. Those that are different at the p<.05 level have different subscripts. All content variables with an astteric were rated along a 3-point scale whereas recall was evaluated along an 8-point scale and novelty along a 7-point scale. In all cases a high number represented a lot of that characteristic.

## Summary and Conclusion

As with the non-laboratory content analyses by independent judges, the most important point to keep in mind is that lucid dreams are more like non-lucid dreams than dissimilar. The nature of the difference does not seem to be due to chance. By chance we would expect seven out of one hundred and thirty five analyses to be significant. We've got 17 at the .05 level. Consequently we conclude that there is a difference which is meaningful but perhaps not substantive. Interestingly if one looks at dream type differences as evaluated by the dreamer both from dream diaries and the laboratory, large dream type differences have consistently emerged (Gackenbach, in press). It can be seen in Table 7, in a new set of this type of data which have been previously unreported that the results of a brief questionnaire which was given to four individuals to fill out both at home and in the laboratory after they had awaken from a dream support this self evaluation trend. Of the 183 dreams evaluated along 12

dimensions 11 showed dream type differences. Many of these scales are essentially the same ones that the independent judges were asked to evaluate the dream along. So the extent to which lucid and nonlucid dreams differ may be largely in the eye of the beholder.

While we are looking at Table 7 let me say more about it. We are not only looking at lucid/nonlucid dream type differences here but you can see that it is further broken down into the nonlucid dreams of lucid (n=2) versus nonlucid (n=1) dreamers and the lucid dreams of a single sophisticated TM meditator. This data is drawn from a study examining the differences between dream lucidity and dream witnessing (Gackenbach, Moorecroft, Alexander, & LaBerge, 1987). (Editors Note: See elsewhere in this issue of Lucidity Letter for the specifics of that study.) Please note two things beyond what I have already mentioned. First the nonlucid dreams of the two lucid dreamers differed from the nonlucid dreams of the one nonlucid dreamer in three ways. They were more recallable which may be due to their greater bizarreness and novelty. We distinguished between these two concepts in the questionnaire. Regarding bizarreness we simply asked the dreamers how bizarre they found the dream to be whereas with novelty we asked them to evaluate the dream in terms of how different from ordinary waking experiences they found it to be. This dreamer type difference in novelty for nonlucid dreams has also been found by Harry Hunt and myself in a larger sample of students who participated in a two week home dream diary study. The bizarreness question was not asked in that study. It would seem in order to have the propensity to dream lucidly one must dream oddly in general!

**Table 8**
**Lucid-Nonlucid Dream Sub-groups Collected from REM**

Group 1 - Lucid Dreams, TM Subject, Signal Verified, n=3

Group 2 - Lucid Dreams, TM Subject, Not Signal Verified, n=5

Group 3 - Lucid Dreams, Lucid Subjects, Signal Verified, n=40

Group 4 - Nonlucid Dreams, Lucid Subjects, No Signal, n=16

Group 5 - Nonlucid Dreams, Nonlucid Subject, No Signal, n=11

(Regarding the dreams of the single TM subject, the conceptual framework for these findings can be found in the June, 1987 issue of Lucidity Letter and in the article in this issue.)

We did one last set of analyses in order to try to account for dreamer type differences in

both lucid and nonlucid dreams. Specifically, we split the laboratory collected dream samples into five groups. These are delineated in Table 8. We compared three types of lucid dreams under three different circumstances to two types of nonlucid dreams under two different circumstances. Keep in mind that the dreams of three of these groups are from one subject each and that the number of dreams available for analyses were very small for two of the groups. For these reasons these analyses must be approached tenuously. As before 135 analyses of covariance were computed on the five groups manifest content subscale scores with number of words in the dream as the covariate. Fewer scales reached conventional levels of significance and in fact the differences could be accounted for by chance factors. The differences which did emerge were largely accounted for by the lucid dreams collected from the lucid dreamers. Most noteworthy is the dream control difference is accounted for by the difference between the lucid dreams of lucid dreamers and the nonlucid dreams of the one nonlucid dreamer. The lucid dreams of the TM subject and the nonlucid dreams of the lucid dreamers did not differ from these two extremes. This suggests that dream control of lucid dreams may be a function of individual difference variables. That is, of the style of dreaming regardless of the state of dreaming.

References

Gackenbach, J.I. (1978). A personality and cognitive style analysis of lucid dreaming. Unpublished doctoral dissertation, Virginia Commonwealth University.

Gackenbach, J.I. (in press). The psychological content of lucid dreams. In J. I. Gackenbach and S. LaBerge (Eds.), Conscious mind, sleeping brain: Perspectives on lucid dreaming. N.Y: Plenum.

Gackenbach, J.I., Moorecroft, W., Alexander, C. & LaBerge, S. (1987). Physiological correlates of "consciousness" during sleep in a single TM practitioner. Sleep Research 16, 230.

Gackenbach, J. I., Snyder, T. J., Rokes, L. M. & Sachau, D. (1986). Lucid dreaming frequency in relation to vestibular sensitivity as measured by caloric stimulation. The Journal of Mind and Behavior: Special Issue: Cognition and Dream Research. 7 (2&3). 277-298.

Garfield, P. (1974). Creative dreaming. N.Y.: Ballantine.

LaBerge, S.P. (1985). Lucid dreaming. Los Angeles: Jeremy Tarcher.

Snyder, T.J. & Gackenbach, J.I. (in press). Individual differences associated with lucid dreaming. In J.I. Gackenbach and S. LaBerge (Eds.), Conscious mind, sleeping brain: Perspectives on lucid dreaming. N.Y.: Plenum.

**Table 9: Adjusted Means and F-Ratios of the Manifest Content for Lucid and Nonlucid Dreams From Lucid and Nonlucid Dreamers Collected in the Sleep Laboratory During REM Sleep**

| Dream Group | Gr 1 | Gr 2 | Gr 3 | Gr 4 | Gr 5[2] | F-Ratios |
|---|---|---|---|---|---|---|
| **Num of Dr** | 3 | 5 | 40 | 16 | 11 | |
| **Words/Dr**[1] | $31.33_a$ | $36.60_a$ | $209.65_b$ | $66.69_a$ | $39.36_a$ | F(4,70)=7.90, p<.0001 |
| **Achieve:** | | | | | | |
| Success | $0.37_a$ | $0.35_a$ | $1.84_b$ | $0.37_a$ | $0.43_a$ | F(4,69)=5.45, p<.001 |
| Achieve Total | $0.74_a$ | $0.70_a$ | $2.62_b$ | $0.93_a$ | $0.96_a$ | F(4,69)=5.28, p<.001 |
| **Elements:** | | | | | | |
| Positive Mod. | $0.86_a$ | $1.62_{ab}$ | $2.79_b$ | $2.01_{ab}$ | $1.16_{ab}$ | F(4,69)=2.97, p<.025 |
| Negative Mod. | $0.62_a$ | $0.99_a$ | $2.11_b$ | $0.91_a$ | $0.76_a$ | F(4,69)=4.43, p<.003 |
| Old | $0.12_a$ | $0.32_b$ | $0.02_a$ | $0.27_{ab}$ | $0.12_a$ | F(4,69)=2.50, p<.05 |
| **Activities:** | | | | | | |
| Phy. (Still) | $1.78_a$ | $1.77_a$ | $4.29_b$ | $1.71_a$ | $1.43_a$ | F(4,69)=7.51, p<.0001 |
| **Characters:** | | | | | | |
| Brother | $0.09_a$ | $0.09_a$ | $-0.02_a$ | $0.12_{ab}$ | $0.36_b$ | F(4,69)=2.77, p<.034 |
| **Misc:** Control | $3.86_{ab}$ | $3.26_{ab}$ | $5.98_b$ | $1.66_{ab}$ | $0.87_a$ | F(4,69)=2.82, p<.032 |

1. Analyses of covarance were calculated on all content scales with the number of words as the covariate. Subscripts indicate the results of the Duncan a-postori tests with $p < .05$. Those that are the same do not differ while those subscripts which are different indicate that the means significantly differ.
2. Group identifiers can be found in Table 8.