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PRIMARY-PROCESS THINKING IN SPONTANEOUSLY-RECALLED
HOME DREAMS AND LABORATORY REM DREAMS

BY

JAMES J. CASPER

Thesis Submitted to the Faculty of Graduate Studies
through the Department of Psychology in Partial
Fulfillment of the Requirements for the Degree of
Master of Arts

University of Windsor
Windsor, Ontario
1971

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ABSTRACT

"Primary-process" has been described by Freud as an unconscious psychical system which is responsible for the irrational and bizarre thinking oftentimes expressed in the manifest dream. On the basis of the hypothesis that the lack of logic, visual representation and the lack of intelligibility in the manifest dream gives evidence of primary-process thinking, F. Auld, et al. (1968) developed the seven-level Primary-Process Rating Scale to measure the amount of primary-process thinking in dream reports.

By rating 54 Spontaneously-recalled home dreams and 157 laboratory REM dreams, collected by Calvin Hall and his associates (1966), according to a modified version of the Primary-Process Rating Scale, this study has attempted to demonstrate the hypotheses that:

1. home dreams contain significantly more evidence of primary-process thinking than laboratory REM dreams;
2. that dreams from later REM periods of the night contain significantly more evidence of primary-process thinking than those from early REM periods;
3. that REM dreams from multiple-awakenings during the night and REM dreams from single-awakenings during the night do not differ significantly in amount of primary-process thinking.

The results yielded by analyses of dream ratings support the hypotheses that home dreams give more evidence of primary-process thinking than laboratory REM dreams, and that REM dreams from multiple-awakenings and REM dreams from single-awakenings do not differ significantly in amount of primary-process thinking. The results do not, however, support the hypothesis that dreams from later REM periods contain more evidence of primary-process thinking than dreams from early REM periods, nor do the results offer sufficient grounds for dismissing the hypothesis entirely.

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The concepts of "primary process" and "secondary process" originated with Freud (1955) in his proposed explanation for the formation of dreams:

Thus we are driven to conclude that two fundamentally different kinds of psychical processes are concerned in the formation of dreams. One of these produces perfectly rational dream thoughts, of no less validity than normal thinking; while the other treats these thoughts in a manner which is in the highest degree bewildering and irrational. (Freud, 1955, p.597)

He developed his understanding of the principal complementary functions of both systems and concluded:

All that I insist upon is the idea that the activity of the first psychical system is directed towards securing the free discharge of the quantities of excitation, while the second system, by means of the cathexis emanating from it, succeeds in inhibiting this discharge and in transforming the cathexis into a quiescent one (....) When once the second system has concluded its exploratory thought activity, it releases the inhibition and damming-up of the excitation and allows them to discharge themselves in movement. (Freud, 1955, pp.599-600)

I propose to describe the psychical process of which the first (unconscious) system alone admits as the 'primary process', and the process which results from the inhibition imposed by the second (conscious) system as the 'secondary process'. (Freud, 1955, p.601)

In the course of dreaming, the secondary process exercises its inhibitory function by way of censorship. The first system constructs the wish which is expressed by the dream, while the second system, by censoring, brings about a distortion of the wish. (Freud, 1955, p.144) The immediate discharge of excitation associated with the primary system is incompatible with the purposive thinking of the secondary system, which is able to allow a limited level of excitation. However, if the ex-

citation becomes too great, on the basis of the pleasure principle, the secondary system withdraws cathexis from the preconscious thoughts presented by the primary system. This is the process of repression. These repressed thoughts which are strongly cathected by unconscious impulses and abandoned by pre-conscious cathexis become subject to the irrational processes of the primary psychical system striving to find an outlet. The distortion of the dream wish by way displacement, visual representation, condensation and lack of logic is the work of the primary system attempting to bypass censorship.

This distorted expression of the original unconscious dream wish as it is reported by a subject, is the manifest dream. The latent dream is the underlying dream-thought. (Freud, 1955, 277-8) The work of interpretation, then, consists in arriving at the latent content by the method of freely associating to the manifest content.

This brief review of Freudian theory regarding the formation of dreams is meant to bring into focus the hypothesis with which this study is concerned: that primary process has a traceable influence on the formation of the manifest dream.

The problem of empirically testing the hypothesis that dream reports contain evidence of primary-process thinking was undertaken by Auld, Goldenberg, and Weiss (1968). Since primary process, according to Freud, accounts for the lack of logic, visual representation and lack of intelligibility

in the manifest dream, the authors, using these indicators, constructed a seven-point rating scale designed to measure the amount of primary-process thinking in dream reports. Material drawn from 300 dream reports collected over a 10 week period from 5 subjects was used as a basis for the scale construction. The scale proved to be a reliable ($r = .876$) method of rating the degree to which the primary-process thinking is evident in dream reports.

Other methods of analyzing manifest dream content have been developed, notably those devised by Hall and Van de Castle (1966), Sheppard (1963), and Saul and Sheppard (1956). These methods, however, consist in categorically classifying the manifest content. The Primary Process Rating Scale devised by Auld et al. differs from these methods in that its use requires an overall judgement about the mode of thinking reflected in each dream report.

The experimental study of dreams and dreaming have been generally influenced by Aserinsky and Kleitman (1953) who discovered the relationship between rapid eye-movement (REM) period and dreaming. REM activity is characterized by

... reversion of the EEG to patterns more like those of waking, by the intermittent occurrence of rapid and conjugate eye movement, by increased irregularity of peripheral autonomic measures (such as pulse and respiration and blood pressure), by sporadic muscular twitches particularly evident about the face and distal extremities, and by either specific diminution of tonus in certain muscle groups or at least levels of muscle tonus.... (Snyder, 1969, p.8)

REM period refers to the recurring periods of sleep which are characterized by this cluster of Physiological

phenomena. Several subsequent studies have established that periods of sleep which are not characterized by REM activity (NREM periods) yield dream reporting as consistently, in some cases, as REM period awakenings. Baldrige(1969) reports:

The probability of obtaining a dream report reached about 70% if the awakening was made after as little as three to seven minutes of REM sleep. This probability dropped sharply when the awakening followed the termination of a REM period, reaching a minimum after seven to fifteen minutes of NREM sleep. As the length of the NREM period increased, however, the likelihood of obtaining a dream report rose to the same high level obtained from REM awakenings. (p.35)

The laboratory dreams to be used in this study, namely, those acquired by Hall and Van de Castle (1966 b) are REM dreams. In view of the evidence of NREM dreams the question arises as to whether REM period dreams are a representative sample of all dreaming activity. Although the presence of this problem is acknowledged, its treatment is not within the competence of this study. Hall and Van de Castle(1966 b, p.3) question whether the problem can be solved at all.

The focus on REM activity in experimental studies on dreams and dreaming raised several questions among which are the following: what influence does the experimental setting have on REM dreams; do dreams differ from REM period to REM period through the night; what influence does the interruption of sleep by dream-reporting have on subsequent REM dreams of the same night?

Although there are a variety of ways in which these questions could be investigated, this study is concerned

with answering them with regard to primary-process thinking. Therefore, the questions are, more specifically: does the experimental setting influence the amount of primary-process thinking in reported REM dreams; do dreams differ from REM period to REM period in amount of primary-process thinking; does the interruption of REM sleep and the reporting of dreams affect the amount of primary-process thinking in subsequent REM dreams of the same night?

Investigations concerning the influence of the laboratory setting on dreaming have been conducted by comparing laboratory dreams with home dreams. In a study conducted by Domhoff and Kamiya (1964) in which the first versions of the Hall - Van de Castle scales were used, home dreams were reported to contain more sexuality, and misfortune-aggressions than laboratory dreams. Dreamers also tended to become involved in aggressive interactions in home dreams, while in laboratory dreams they tended to merely witness aggressive interactions. The Hall - Van de Castle study (1966 b) support these results:

...there are more aggressions, failures, misfortunes, and castration anxiety in home dreams. Not only is there more aggression in home dreams, but the nature of the aggressive interaction is more intense. The dreamer is more likely to initiate a friendly interaction in home dreams. (Hall, Van de Castle, 1966 b, p.20)

A comparison between home dreams and laboratory dreams reported at a single awakening during the night, and home dreams and laboratory dreams reported at multiple awakenings

during the night yielded similar results. Hall and Van de Castle report in conclusion that "laboratory dreams appear to be less dramatic and more prosaic than home dreams."

(Hall and Van de Castle, 1966 b, p.21).

Partially contradictory results, with regard to active participation and sex, were observed by Weisz and Foulkes (1968) who report:

Results showed no significant difference between home and laboratory dreams in ... dream ratings for Vivid Fantasy, Unpleasantness, Active Participation, and Sex. Home dreams were judged to contain more Verbal Aggression ($p > .02$) and Physical Aggression ($p > .08$)

The fact that the method and time of obtaining the dream reports in the last study differed from the similar method and timing used in the first two studies, and the fact that the first two studies are based on a broader sample of dreams than the last, may account for the slight difference in results.

In all of these studies, however, the concentration has been on dream content, rather than on the mode of thinking. This study will compare laboratory dreams with home dreams on the basis of the mode of thinking, using a modified version of the Primary Process Rating Scale (Appendix A) as a measure of primary-process thinking.

Investigations into the influence of awakening and the reporting of dreams on subsequent REM dreams have been few. Dement and Wolpert (1958) made reference to the possible influence of awakening and reporting on the results of their

study, but did not treat the problem specifically:

Not only is a dream abruptly and unnaturally terminated, but a series of events, namely the awakening, the description of the dream, and the handling of the recording apparatus, are added to the dreamer's store of "day residues", which may influence the subsequent dreams. (p.576)

Trosman et al. (1960) and Offenkrantz and Reschtschaffen (1963) using REM dreams reported that dreams of a night tended to centre on a single conflict, but neither study considered the influence of awakening and reporting on subsequent dreams. Verdone (1965) reported that REM mentation "is more 'dream-like' (e.g. more vivid and more emotional) later in the night than early in the night...." (p.1265) He observed also that the "temporal reference of manifest dream content changes as the night progresses," that is, there were more references to events which were not recent, as the night progressed. In commenting upon his results, Verdone makes reference to Freud's statement that the cessation of sensory input during sleep permits the revival of memories of past events.

Hall and Van de Castle (1966 b), as one dimension of their study, compared REM dreams from single awakenings with those from multiple awakenings in order to assess the influence of previous awakenings upon later dream reports and in order to assess the influence of previous awakenings upon later dream reports and in order to determine whether dreams differ from REM period to REM period. The comparisons were made on the basis of their content scales. Their conclusion

contradicted that of Verdone (1965): "It seems reasonably safe to conclude that later dreams are not greatly different from early dreams for the variables used in this study." (p.23) They also stated: "It is probably safe to conclude, therefore, that single dreams and multiple dreams are comparable samples of dream life." (p.21)

The reported studies concerning early and late REM dreams and the influence of previous awakenings on later dreams focus exclusively on dream content. With emphasis on the mode of thinking, this study will compare REM dreams from single awakenings, with REM dreams from multiple awakenings, both samples of which have been collected by Hall and Van de Castle (1966 b), from early and late REM periods. A modified version of the Primary Process Rating Scale (Appendix A) will be used as a measure of primary-process thinking and basis for comparison.

Summary and Hypotheses

Studies comparing the content of home and laboratory dreams report more material in home dreams which might be associated with primary process: misfortunes-aggressions, castration anxiety, sexuality (Domhoff and Kamiya, 1964; Hall and Van de Castle, 1966b). In view of the reported results of these studies the question arises as to what accounts for the difference between home and laboratory dreams.

In spite of the home-like experimental setting in the

Hall and Van de Castle study, it is interesting to note that there is a very low instance of overtly sexual dreams and wet dreams. The wet dream incident in young adult males seems to be normally higher than the one or two instances of such an occurrence reported in their study. (Hall and Van de Castle, 1966 b, P.46-47; Domhoff, 1969, p.211). Moreover, the difference between involvement in aggressive interactions in home dreams, and the mere observation of aggressive interactions in laboratory dreams, as reported by Domhoff and Kamiya, is another factor which leads to the formulation of the hypothesis that the laboratory setting has an inhibitory effect on dreaming. This hypothesis that the laboratory setting induces more psychological vigilance in the dream work could be associated with fear of exposing oneself to another, with the expectation of being awakened without warning, or with a number of other factors associated with the experimental design. In any case, it appears that the experimental conditions give rise to more stringent censorship. In view of this, it is expected that home dreams will contain more evidence of primary-process thinking than laboratory dreams. The more stringent the censorship, the less chance there seems to be for the appearance of elements which could be associated with the primary process.

The Hall and Van de Castle study has attempted to evaluate the effects of multiple awakenings on subsequent dreams by comparing single and multiple-awakening dreams, and dreams

from early and later REM periods on the basis of content. The reported absence of any significant difference is not in accordance with Verdone's conclusion that dreams from later REM periods contain more references to earlier periods of a subject's life than dreams from early REM periods. Verdone's conclusion that there is a difference among dreams of a night, in terms of temporal reference, is supported to some extent by Trosman et al. (1960) who conclude that "as need pressure accumulates in the early dreams of a sequence, it is discharged in a pitched of excitement either directly or by a highly dramatic visual representation...." (p.606)

The "highly dramatic visual representation" referred to could be associated with one function of the primary process system. Verdone's identification of less recent events in dreams from later REM periods, and more obvious day-residue material in dreams from early REM periods suggest the possibility of an increasing linkage between day-residue material and unconscious derivatives as the night progresses. Freud makes reference to series of dreams which, though instigated by present-day wish, "received a powerful reinforcement from memories that stretched far back into childhood." (1955, p.193)

The problem of explaining how dreams from later periods of the night contain more references to less recent events was partially treated by Freud when he quoted Scherner's law:

...at the beginning of a dream it depicts the object from which the stimulus arises only by the remotest and most inexact allusions but at the end, when the pictorial effusion has exhausted itself, it nakedly presents the stimulus itself....(Freud, 1955, p.335)

He then immediately presents a demonstration of the law by describing a series of two dreams of the same night. The explanation seems to point, in this instance, to the relaxation of defenses or of censorship as the night progresses.

When we consider that Freud never admitted the possibility of a dream materializing from a conscious wish without reinforcement from an unconscious wish, and when we also consider that "every wish which is represented in a dream must be an infantile one" (Freud, 1955, p.553), then it is possible to hypothesize that the affect given to a conscious wish by reason of its association with an unconscious wish, eventually leads, through a series of dreams during the night, to the presentation of elements more closely identified with the source of affect. Assuming that the source is an infantile wish, its presentation in dreams would probably be associated with its proper temporal characteristics, thus explaining the presence of references to earlier periods of life in dreams from later REM periods. Since infantile wishes or unresolved conflicts from earlier periods of life are unconscious and therefore associated with primary process, it is expected that dreams from late REM periods will contain more evidence of primary-process thinking than dreams from early REM periods.

Since this expected result is based on the hypothesis

that consecutive dreams lead eventually, through regressive association, to the presentation of material more closely identified with the unconscious source of affect, it is expected that dreams from later REM periods, will consistently give evidence of more primary-process thinking than those from early REM periods, in spite of the experience of being awakened to report a dream. REM dreams from the same period of the night should not differ in amount of primary-process thinking whether they be dreams from multiple awakenings, or dreams from single awakenings. The experience of being awakened to report serves the purpose, it would seem, either of reporting what would not have been spontaneously recalled upon awakening in the morning, or of focusing upon material which is already preconscious. Thus it does not seem that multiple awakenings through the night should interrupt the process of temporal regression.

Should dreams from single awakenings contain significantly more evidence of primary-process thinking than dreams from multiple awakenings, then it would appear that multiple awakenings contribute to the store of day-residues and to the strengthening of defenses, and interferes with the process of temporal regression toward the source of affect.

METHOD

Subjects

The subjects whose dream reports were used for this study were 9 of the 11 volunteer male college students who participated in the Hall and Van de Castle study (1966b). Two subjects, bearing the code names Nietzsche and Thor, listed in the published monograph of their study will be eliminated because the former reported no multiple dreams, and the latter reported no multiple or home dreams. Further detailed information about each subject is given in the monograph (pp.5 - 7).

Hall and Van de Castle report that each of these subjects, except for one, was given a period of seven nights to adjust to the laboratory bedroom, which was made as home-like as possible, and to the experimental attachments (EEG electrodes, and strain gauge) and procedure. The one exception was a subject who had an adjustment period of only five nights.

Awakening and Reporting Procedures

Hall and Van de Castle describe the awakening and reporting procedure as follows:

When the monitor decided it was time to awaken S... he turned off the EEG, entered the experimental bedroom quietly, and called the S's name in a low voice. If S did not respond on the first call, he was called again. The monitor then asked if S had been dreaming. If he replied affirmatively S related the dream to the tape recorder. Often S would think about what he had been dreaming before taping it. Sometimes S would fall asleep while he

was remembering a dream. When this happened, the monitor aroused S again. Otherwise, the monitor sat quietly in a chair about five or six feet away from S's bed. The light was not turned on in the bedroom. (p.9)

The monitor was instructed to awaken the subject about ten minutes after the beginning of a REM period. The beginning of a REM period was defined as: "the first burst of eye-movement in an emergent Stage 1 brain wave pattern consisting of fast, low voltage waves without spindling." (p.10) The time of awakening was adjusted for the first REM period which usually did not last as long as ten minutes.

Awakening Schedules and Types of Dreams

Hall and Van de Castle report that there were two experimental periods for the subjects with which this study was concerned. During the first period, subjects were awakened once a night according to a predetermined schedule, until one dream from every REM period from REM I to REM IV was reported. One set of dreams from REM I to REM IV was collected before the next was begun until 4 dreams from each REM period were collected. This schedule will be referred to as single awakenings, and the dreams reported during this period will be referred to as single-awakening dreams.

During the second experimental period, subjects were awakened during every REM period of the night. This schedule will be referred to as multiple awakenings, and

the dreams reported during this period will be referred to as multiple-awakening dreams.

Finally, home dreams are those reported by subjects at home upon awakening during the night or in the morning. They were usually written out on printed forms; occasionally, however, they were tape recorded.

Rater Reliability

An essential part of the preliminary stage of the study, was learning the appropriate use of the Primary Process Rating Scale. Initially, dreams were rated on the basis of the printed instructions in the article of Auld, et al. (1968). In order to assess the reliability of the author's use of the rating scale on the basis of these instructions, the author and a second rater independently rated 30 dream reports, provided by the research advisor, which were not a part of this study. The reliability coefficient was .59.

Since this reliability measure gave evidence of an undesirably wide variance in judgement, both raters met with the advisor, a co-author of the scale, to discuss at length the appropriate use of the rating scale. It was at this point that two changes were made in the scale's description of levels (Appendix A).

Transitions in time, space, or sequence had been included in the criteria for level 3 as well as for level 4 with the distinction that such transitions at level 4 were "rapid". Because of the difficulty in distinguishing between rapid

shifts and other shifts. It was decided to assign all unexplained transitions in time, space, or sequence to level 3.

The second change consisted of eliminating at level 6 the phrase, "Taboo acts are presented without disguise." This change was made because the author discovered that taboo acts, a content classification rather than a specification of mode of thinking, had been reported in some dreams within the context of an apparently controlled mode of thinking, otherwise representative of levels 1 or 2. It seemed best to let the mode of thinking rather than content be decisive in determining the score.

The advisor then provided the same two raters with 50 other dreams which were not from those scored in the main part of this study. These were rated according to the modified version of the Primary Process Rating Scale. The product moment correlation between the two independent raters was .92.

Since this last-mentioned study of reliability of ratings had been preceded by a lengthy discussion with a co-author of the scale concerning appropriate scoring, the question arose as to whether a rater who received only minimum instructions on the use of the scale could use the scale reliably. Therefore, a third rater, given the minimum instructions (Appendix B), was asked to rate the 50 dreams from among those used in this study. The correlation between his rating and that of J. Casper was .73 .

In order to ensure that the source of the dreams was unknown to the author and to the other raters, the experimental supervisor provided the dream reports required for the study. Each dream protocol was identified only by a number assigned according to a table of random numbers. The information required to identify the source of the dream was provided subsequent to the rating.

Statistical Design

To determine whether home dreams contain more evidence of primary-process thinking than laboratory dreams, 54 home dreams and 157 laboratory dreams, were rated according to a modified version of the Primary Process Rating Scale. The laboratory dreams consisted of 72 single-awakening dreams (2 dreams per subject from each of the first 4 REM periods) and 85 multiple-awakening dreams. The design was intended to include 2 dreams per subject from each of the first 5 REM periods of the night during the multiple-awakening schedule. However, Subject 2 lacked one multiple-awakening dream from REM II; Subject 6 lacked one multiple-awakening dream from REM I; and Subject 8 lacked three multiple-awakening dreams: one from each of the first three REM periods. This accounts for the odd number of 85, which necessitated the use of analysis of variance designs for unequal frequencies.

Subsequent to the rating of the dreams, a comparison of 54 home dreams and laboratory dreams was carried out within

a 2 x 9 factorial design for analysis of variance (2 conditions, 9 subjects). The unequal cell frequencies and unequal sample sizes were dealt with by means of the least-squares solution. This method was chosen because it was considered preferable to treat the wide variation between the number of home and laboratory dreams as proportional to the population from which they were drawn, rather than projectively compare them on the basis of what home dreams would be like if there were 157 such dreams. (Winer, 1962, pp.222-224)

To determine whether single-awakening dreams differ from multiple-awakening dreams in amount of primary-process thinking, the ratings for the 72 dreams from single-awakenings were compared with the ratings for 67 dreams from multiple-awakenings. The design was intended to include 2 single-awakening dreams, and 2 multiple-awakening dreams per subject from REM I to REM IV. However, the missing dreams which are identified above from the multiple-awakening schedule required that the rating be compared within a 2 x 8 x 9 factorial design for unequal frequencies. (2 types of dreams, single and multiple-awakening; 8 REM periods, 4 per type of dream; 9 subjects). In this case, the unweighted-means method of dealing with unequal cell frequencies seemed most appropriate.

To determine whether dreams from later REM periods contain more primary-process thinking than those from early REM periods, ratings of multiple-awakening dreams from REM I to REM V inclusive, were compared. Since missing multiple-

awakening dreams prevented a complete design of 2 dreams per subject from each REM period, ratings were compared within a 5 x 9 factorial design for analysis of variance with unequal cell frequencies (5 conditions, 9 subjects). A Scheffe test of significance was made on the data for Factor A (REM periods). This test was chosen because of its rigidity with respect to Type I errors. (Winer, 1962, p.85) The .05 level of significance was used as the criterion for accepting the stated hypotheses.

RESULTS

The unweighted average for home dreams is 1.76; for laboratory dreams it is 1.64. As the analysis of variance indicates, the difference, although small, is significant.

Among the multiple-awakening dreams from REM I to REM V the mean scores for dreams from each REM period are as follows:

REM I	REM II	REM III	REM IV	REM V
2.25	1.31	1.47	1.33	2.00

The predicted trend of increasing magnitude from REM I to REM V is not apparent on the basis of these mean scores.

Among the single-awakening dreams from REM I to REM IV the mean scores for dreams from each REM period are as follows:

REM I	REM II	REM III	REM IV
1.39	1.67	1.78	1.61

Although there is not a consistently monotonic increase from one REM period to the next for the means of the single-awakening dreams (because of the reversal at REM IV), these results fit the prediction better than those of the multiple-awakening dreams.

An analysis of the variance between home and laboratory dreams, as rated according to the Primary Rating Scale, indicates that the variance due to the difference between the two types of dreams is significant at the .05 level. The variance due to the differences among subjects is also significant at the .01 level.

Table 1

Summary of Analysis of Variance for Home and Laboratory Dreams
(Least Squares)

Source of Variance	SS	df	MS	F
A (Home and Lab Dreams)	5.15	1	5.15	5.42*
B (Subjects)	31.63	8	3.95	4.16**
AB	2.42	8	.30	.32
Error	183.85	193	.95	

* F .95 (1,200) = 3.89

** F .99 (8,200) = 2.60

Thus, home dreams were found to contain more evidence of primary-process thinking than laboratory dreams, in spite of significant differences among subjects. A comparison of the home/lab mean-square with the interaction term shows the home/lab variance to be significantly greater, which implies that the home/laboratory difference is a general one, not an effect occurring among some subjects but not others.

An analysis of the variance among multiple-awakening dreams from REM I to REM V, as rated according to the Primary Process Rating Scale, indicates that the variance due to the difference between REM periods is not significant at the .05 level, while the variance due to the difference between subjects is significant.

Table 2

Summary of Analysis of Variance for Multiple-Awakening Dreams
from REM I to REM IV (Unweighted Means)

Source of Variance	SS	df	MS	F
A (REM periods)	10.80	4	2.70	2.37
B (Subjects)	23.12	8	2.89	2.54*
AB	52.78	32	1.65	1.45
Error	45.50	40	1.14	

F .95 (4,40) = 2.61

F .95 (8,40) = 2.18

F .95 (30,40) = 1.74

Since the variance due to the difference between REM periods comes close to significance at the .05 level, the Scheffe test of significance was done on the means of Factor A (REM periods) using the .05 level of confidence.

Table 3

Scheffé Test of Significance on Scores for Multiple-Awakening Dreams. (REM periods are arranged in increasing order of magnitude according to mean scores)

	REM IV	REM II	REM III	REM V	REM I
REM IV			1	6 *	7 *
REM II			.5	5.5*	6.5*
REM III				5 *	6 *
REM V					1
REM I					

* $q = 4.89$

As the test indicates, the difference between REM I and REM II is significant, the difference between REM I and REM III is significant, and the difference between REM I and REM IV is significant. However, since REM I gives most evidence of primary-process thinking, and REM IV gives least evidence, the direction of the differences observed is opposite to what was predicted. On the other hand, when the difference between REM II and REM V, REM II and REM V, REM IV and REM V are considered, all of these are significant in the predicted direction.

Thus, while the difference between REM V and the other REM periods, exclusive of REM I, support the hypothesis regarding more evidence of primary-process thinking in later

REM periods, the difference between REM I and other REM periods, exclusive of REM V, contradict the hypothesis.

Since an analysis of variance could not assess the agreement between the ordering actually observed and the predicted ranking, Kendall's Rank Correlation Formula 3.3 (Kendall, 1948) was used to determine whether there was a significant increase in ratings from REM I to REM IV. The value of S observed was 151, and $\hat{c} = 0.06$. In a test of significance, $t = 0.33$. As the results indicate, the difference in ratings from REM I to REM V consecutively, is not significantly different from zero.

The analysis of variance for single and multiple-awakening dreams from REM I to REM IV indicates that the variance due to the difference between single and multiple-awakening dreams is not significant. Also, the variance due to the difference between REM periods is not significant.

Table 4

Summary of Analysis of Variance for Single and Multiple-Awakening Dreams from REM I to REM IV

Source	SS	df	MS	F
A (Single & multiple)	.07	1	.07	.07
B (REM Periods)	1.58	3	.52	.55
C (Subjects)	19.51	8	2.43	2.58*
AB	7.01	3	2.33	2.47
AC	6.87	8	.85	.90
BC	20.99	24	.87	.92
ABC	25.30	24	1.05	1.11
Error (within cell)	63.50	67	.94	

* $F_{.95}(8.60) = 2.10$

However, the variance due to the difference between REM periods is significant, indicating that the subjects do differ from each other, in general, in the amount of primary process material in their dreams. The interaction between the single/multiple method of collecting dreams and REM periods falls short of significance at the .05 level ($.05 < p < .10$). There is a hint, therefore that the single/multiple condition affects level of primary process differentially, depending on the REM period.

DISCUSSION

The results of the present study suggest that from the point of view of primary-process thinking, as expressed in dream reports, home dreams represent a different sample of the total population of dreams than that represented by laboratory dreams. The lesser amount of primary-process thinking in laboratory dreams indicates the influence of secondary process, or a greater amount of thinking which more closely resembles conscious, controlled thought. It appears, therefore, that the laboratory setting, or the experimental procedure, exerts an inhibitory influence on the mode of thinking expressed in the reports of laboratory dreams. However, the difference between the home and laboratory scores is small.

The implications of this finding has bearing on what one intends to do with either home dreams or laboratory dreams. If one's aim is to use dream material to learn more about a subject's unexpressed wishes and unresolved conflicts, then the results of this study suggest that the subject's home dreams would yield slightly more regressive material than the same subject's laboratory dreams. For other purposes, the use of home or laboratory dreams probably would not affect the results significantly.

While demonstrating that subjects vary widely, this study indicates that the manifest content of home dreams gives more evidence of primary-process thinking than does the manifest content of laboratory dreams.

Assuming that laboratory dreams represent an identifiable sample of the total population of dreams, the problem of establishing a dreaming pattern according to REM periods on the basis of amount of primary-process thinking was not by any means solved. The data do not support the hypothesis that laboratory dreams from later REM periods of the night contain more evidence of primary-process thinking than those from early REM periods. Yet, the data do not warrant a total rejection of the hypothesis. The question which the data immediately raise is why does REM I in multiple-awakening dreams give significantly more evidence of primary-process thinking than REMS II, III, IV?

The rationale supporting the hypothesis that dreams from later REM periods contain more evidence of primary-process thinking, was based on the theory of progressive temporal regression toward the unconscious dream-wish which is the source of affect. Temporal regression, it was hypothesized, would account for the presence of material in later REM periods of the night which could be associated with primary-process thinking. Even if this hypothesis explains the greater evidence of primary-process thinking in REM V as compared with REMS IV, III, and II, it does not explain the greater evidence of primary-process thinking in REM I multiple-awakening dreams, as compared with REMS II, III, and IV.

The confused results do not offer grounds for a definite conclusion either in support of or contrary to the proposed

hypothesis. In a previous study in which dream protocols drawn from the same pool of data were used, A. Strenski found a significant difference in amount of primary-process thinking between early, middle and late REM periods. These contrary results may be partly due to the fact that she included dreams from REMS VI, VII, and VIII in her "later" REM periods, and these dreams from periods VI, VII, and VIII tended to have higher scores. (Strenski, 1970). Her finding is, however, consistent with the slight evidence pointing to a predominance of primary-process thinking in later dreams. (Jones, 1970, p.37)

Considering the results of this study as well as the evidence to date concerning primary-process mentation in later dreams, one might question the wisdom of envisioning the transitions from secondary to primary-process thinking in terms of a linear model. Perhaps a wavyline fluctuating between imaginary levels of primary and secondary-process thinking may be a more appropriate model. Such a pattern is suggested by Jones (1970, Figure 2) in the diagram of his tri-phasic model (wakefulness, thinking sleep, and dreaming sleep). He depicts wakefulness at the level of secondary process predominantly, dreaming-sleep at an increasing level of primary-process as the night progresses, and thinking-sleep at varying levels of secondary process, predominantly. Dreaming sleep is synonymous with REM mentation; thinking sleep with non-Rem mentation. In view of the results of

this study, it may be worthwhile to investigate the value of a model which considers the fluctuation between predominant primary and secondary-process thinking independently of REM activity, rather than coincidental with REM activity, in the case of primary-process thinking, and with non-REM activity, in the case of secondary-process thinking.

While no decisive statements can be made about primary-process thinking in different REM periods, the results of this study do offer grounds for stating that the difference between single and multiple-awakening laboratory dreams is not significant in terms of primary-process thinking. The results suggest that in studies which make use of laboratory dreams, the use of a multiple-awakening schedule of dream reporting, or a single-awakening schedule should not affect the mode of thinking expressed in the dream significantly. Whatever the awakening and reporting schedule, the mode of thinking should remain relatively constant.

Conclusions:

1. Home dreams give more evidence of primary-process thinking than laboratory dreams.
2. The evidence of primary-process thinking in single-awakening laboratory dreams is not significantly different from the evidence of primary-process thinking in multiple-awakening laboratory dreams.

APPENDIX AModified Version of the Primary-Process Rating Scale
(Auld, et al., 1968)

1. The dream is logical, and there is nothing unusual happening in it.
2. The dream is logical and orderly, but an unusual (though not impossible) event is described in it.
3. Some event in the dream is impossible or involves a contradiction; or there is obvious symbolism; or the transitions in time, space, and sequence are not explained; or there is something mildly uncanny in the dream, such as a feeling that one cannot move.
4. There¹ is a highly illogical or quite impossible series of events; or human qualities are attributed to animals or to inanimate objects; or the dream depicts a dead person coming back to life to watch the living; or the dream as a whole is moderately bizarre or uncanny.
5. There are one or more instances of metamorphosis or condensation; or the dream as a whole is a bizarre fantasy.
6. The dream as a whole is very bizarre, quite uncanny, and autistic, but there are still some logical linkages in

¹The category "rapid shift in time..." as opposed to unexplained transition in the previous category, was deleted here.

the dream. (Visual representation is often employed.)²

7. The dream as a whole is extremely bizarre, uncanny, and autistic. Events in the dream lack any obvious relationship to each other. There may be depersonalization - the dreamer seeing himself in the dream as observing himself.

²"Taboo acts represented without disguise" was deleted here due to resulting confusion with other categories.

APPENDIX B

Minimal Instructions on the Use of the Primary Process Rating Scale

This scale was developed as a means of classifying dream reports according to the mode of thinking expressed in the report. The seven levels, therefore, are primarily concerned with the mode of thinking rather than content. Level 1 represents a minimum amount of primary-process thinking. Thus because a dream is logical, orderly and is representative of a rational and controlled way of thinking, it is considered to be expressive of a minimum amount of primary-process thinking. Level 7, on the other hand, represents a maximum amount of primary-process thinking. In other words if a dream is extremely bizarre, illogical and autistic it is considered to be expressive of a maximum amount of primary-process thinking.

If a dream report has any characteristic of a particular level, the dream is considered to be representative of that level even though it may give the over-all impression of belonging to a lower level. For example, if a dream report is logical and orderly for the most part, but contains one instance of a rapid and unexplained transition in time or space, the dream is considered to be a level 3 dream, by reason of this single instance of rapid and unexplained transition.

It is important that the description of each level of primary-process thinking as indicated by the scale be adhered to strictly. In other words, your judgement should be made as much as possible, on the basis of the scale's description of

each level rather than on the basis of subjective judgement. If a dream report appears ambiguous in terms of its level of primary-process thinking, then assign it to the level which best appears to approximate the mode of thinking reflected in the dream.

The following is a description of each of the seven levels of the primary-process rating scale together with an example of a dream which is considered to be representative of each level. You are asked to assign the appropriate level-number to each dream report.

1. The dream is logical, and there is nothing unusual happening in it.

Example: I was at a restaurant, and I was with this woman I work with. We were eating. I was wearing a very stunning medium-blue dress. It had big, puffy, three-quarter-length sleeves. My hair was a little longer than it is now.

2. The dream is logical and orderly, but an unusual (though not impossible) event is described in it.

Example: I dreamed that my sister looked up a word in the dictionary, which she described to my mother. I don't remember the word, but I didn't like it, and I looked up the word. It had something to do with funerals, being dead or in the state of dying - something like that. I told her she shouldn't do that, and I don't know if I hit her or not. It took place in my sister's bedroom.

3. Some event in the dream is impossible or involves a contradiction; or there is obvious symbolism; or the transitions in time, space, and sequence are not explained; or there is something mildly uncanny in the dream, such as a feeling that one cannot move.

Example: I was at the administration building sitting at the

outside of the building selling shoes. But I really wasn't selling shoes, I was just sitting there. I had my shoes on, and this guy came along and stole my shoes. He was Bill, who is a salesman at Hudson's. There was also a bunch of other guys lined up with me by the administration building. Bill stole my shoes, and he was conducting a rummage sale. I had to buy my shoes back for 98 cents, and I was pretty mad. I don't remember if I had the 98 cents or not.

4. There is a highly illogical or quite impossible series of events; or human qualities are attributed to animals or to inanimate objects; or the dream depicts a dead person coming back to life to watch the living; or the dream as a whole is moderately bizarre or uncanny.

Example: I was in the State of Washington, and I saw a guy walking down the street with a sweatshirt on. It said "Booth Newspapers." The next thing I knew there were girls running in a track race. They were wearing track suits. Then I was in a photography class here at Wayne and the instructor was looking at the pictures and analyzing them. He was looking at this one picture and said it was a very good shot. I looked at it, and all of a sudden I was really there. The picture was of a big cliff with the ocean at its bottom. I was there taking pictures with a camera. And way far below on the shore came a girl water-skiing. Then I was with my cousins (a married couple) at the top of the cliff, and Tom was taking pictures too, I think. My cousin Mary's girl friend, Betty, was there too. I was looking down the cliff.

5. There are one or more instances of metamorphosis (e.g., the changing of a lion into a person) or condensation (e.g., the presence of the qualities of two people in one person); or the dream as a whole is a bizarre fantasy.

Example: In this dream it started out I was walking down the cellar stairway. It was a fairly long stairway and rather dark When I got to the bottom I turned to the right and there was a door there and I opened the door. And when I opened the door on the other side of the door there was a very large, very yellow lion, sitting there. And it was staring at me.... I was very frightened and slammed the door and secured the latch on the door. And then I turned around and faced the other part of the basement, and as I turned around I saw lots and lots of other kinds of animals, all sitting in the shadows in the basement. Wild animals, large animals, tigers, and lions and

leopards and panthers. And, like the first lion, they were just sitting and some of them were lying down and just looking at me. And I was sort of stunned, I didn't know what to do. I had a feeling of panic. And I couldn't move for a long time. And finally, I screamed.... And as I did this, after I screamed, they all got up and they started very slowly and methodically walking toward me. When they started doing this I turned around rapidly and started running up the stairs.... And when I got nearly to the top, almost to the top, I looked up to see the door at the head of the stairway and there was another lion standing there... So I started backing down the stairs again because he was walking towards me down the stairs. And I was, I had walked or run almost halfway back down the stairs again, and turned and all of these animals which had been in the basement were standing at the foot of the stairs and they started to laugh. And they were laughing and laughing, and when they started to laugh, they turned into people. And they were people that I had known a long time. Childhood playmates. People whom I went to school with....

7. The dream as a whole is extremely bizarre, uncanny, and autistic. Events in the dream lack any obvious relationship to each other. There may be depersonalization - the dreamer seeing himself in the dream as observing himself.

Example: Our Easter baskets were on this table - to be filled by the Easter rabbit. Oh, some men broke into the house! Robbers or something; I don't know what they were after. But in the course of whatever they were doing, they took me, and they put me under the table, and then they cut me up into tiny pieces, oh, a couple-inch-square pieces - oh, just one big mess. There wasn't any blood. It wasn't messy or anything - just little pieces, and then while they were cutting me up I was there and I wasn't. I could see them doing it, but I didn't feel like I was being cut up, and yet I saw them cutting me up.

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