

Psychopharmacologia 7, 123-137 (1965)

USPHS Hospital, Lexington, Kentucky

Alterations in Consciousness Produced by Combinations of LSD, Hypnosis and Psychotherapy

By

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(Received June 18, 1964)

In a previous report, LEVINE et al., suggested that the combined simultaneous use of LSD and hypnosis in conjunction with psychotherapy gave rise to a state which appeared different than that produced by either LSD or hypnosis. By employing hypnosis, the authors felt that they were better able to structure, control and manipulate the LSD experience for therapeutic purposes and to produce a more profound "alteration in consciousness" than could be achieved by LSD alone.

There has been little research devoted to the control of drug experience by means of psychological maneuvers, such as hypnosis. FOGEL and HOFFER reported the successful use of hypnotic suggestion in terminating the LSD experience in one individual. Hypnosis also has been employed to modify the subjective effects of such drugs as morphine (LUDWIG and LYLE) and ethyl alcohol (PLATONOV and MATSKEVICH).

The present study represents an effort to measure quantitatively the "alteration in consciousness" produced by the combined use of LSD, hypnosis, and psychotherapy and to compare this with the "alteration in consciousness" produced by LSD alone, LSD combined with psychotherapy, hypnotherapy, and psychotherapy treatment sessions.

Procedure

Subjects

Seventy "post-narcotic drug addict" inpatients (40 males, 30 females), who were recommended for psychotherapy (at a previous staffing conference), volunteered to participate in this study. All patients were between the ages of 21-35 years, had not been admitted to the USPHS Hospital, Lexington, Kentucky, more than three times (approximately 75% were first admissions), had no serious physical illness and were literate. In addition, all patients had successfully passed the handclasp and postural sway suggestibility tests during a prior screening session.

Measuring Instrument

Although many questionnaires (ABRAMSON; ABRAMSON et al., BLEWETT and CHWELOS; HAERTZEN and HILL; HAERTZEN et al., HILL et al. 1963 a; HILL et al. 1963 b; JARVIK et al.) are available for measuring

the subjective effects of LSD in humans, the questionnaire composed by LINTON and LANGS (1962a, 1962b) seemed most appropriate for this study since it was also designed to measure "altered states of consciousness" produced by means other than the administration of LSD. Thus, the subjective effects produced by hypnosis and psychotherapy could be measured and compared with those produced by LSD.

The Linton-Langs Questionnaire (as modified by the authors) is composed of 73 items which have been grouped on an *a priori* basis into seven scales (see Table 1). Patients were read each of the items and their response (positive or negative) was then recorded.

Treatment Techniques

The study took place within the context of a major psychiatric treatment project (LUDWIG and LEVINE, a). *Ss* were assigned alternately to each *E* and were treated in the following manner. They were seen first for approximately a one and one-half hour psychiatric, information-gathering interview, at the end of which the *E* administered the modified Linton-Langs Questionnaire. This constituted the baseline measure (B).

After obtaining this baseline, the *Es* proceeded to train every *S* in hypnosis. A high eye fixation induction technique using suggestions of drowsiness, tiredness and relaxation was used. The modified Linton-Langs Questionnaire was given again (2nd testing) while the *S* was still in hypnosis. Comparisons of hypnosis to baseline scores are reported elsewhere (LUDWIG and LEVINE, b).

All *Ss* were seen within 10 days after their initial interview and assigned consecutively to one of the five treatment conditions selected for study. The following five conditions, employing combinations of LSD, hypnosis and active psychotherapy, were used:

a) *Hypnodelic Condition (HD)* = *LSD* + *Hypnosis* + *Psychotherapy*. At the beginning of the session each *S* was given 2 micrograms/kg of LSD¹ orally and immediately following this the *S* was hypnotized again using a high eye fixation technique. An attempt was made to deepen the hypnotic trance as much as possible during the 30 to 45 min before the onset of the drug effect, but precautions were taken to avoid making suggestions specific to the content of the items on the Linton-Langs Questionnaire. At the end of this time interval, an "insight-interpretive" form of psychotherapy (ELLIS), utilizing much of the information obtained during the previous interview, was begun.

b) *Psychedelic Condition (PD)* = *LSD* + *Psychotherapy*. Each *S* was given 2 µg/kg LSD orally at the start of the session. Then psychotherapy was begun in a manner similar to that described for HD above.

¹ d-lysergic acid diethylamide tartrate in distilled water.

Table 1. *Modified Linton-Langs Questionnaire**I. Alteration in Thinking Scale — 13 items*

12. Have you found it hard to concentrate on the tasks being given you?
22. Have events or experiences seemed illogical or disconnected?
26. Have some things seemed meaningless to you?
32. Have you lost control of your thoughts?
33. Have your thoughts taken possession of you?
34. Does it feel as if someone else were controlling your thoughts?
40. At times have your thoughts been moving faster than usual?
41. At times have your thoughts been moving slower than usual?
47. Do you think that your judgement and ability to evaluate are better than usual?
48. Is it hard to hold onto thoughts, ideas, or images — do they seem to get away from you when you try to catch them?
51. At times has your mind been a blank so that you have had no thoughts at all?
58. Does one idea, thought, or image keep coming back again and again?
73. Do you find that while you are answering a question you tend to forget what the question was?

II. Disturbed Time Sense Scale — 4 items

7. Have you felt occasionally that you have lost your sense of time?
24. Has time been passing faster than usual?
25. Has time been passing slower than usual?
38. Has it felt that time has come to a standstill or stopped now and then?

III. Loss of Control Scale — 16 items

1. Have things felt unreal, as if you were in a dream?
8. Have you felt that you might lose control over yourself?
9. Have you felt that you have lost control over yourself?
10. Have you found it more difficult to move than usual?
19. Have you been acting silly?
36. Have you found it hard to talk?
43. At times have you felt that you have lost control over your body?
44. At times have you felt that you might lose control over your body?
45. Has it felt as if someone or something else has taken control of your body?
50. At times have you felt that you were withdrawing from reality or losing your hold on the real world?
52. Have you been at all afraid that you might go crazy or lose your mind?
53. Have you lost control over your emotions and feelings?
54. Have your emotions and feelings taken possession of you?
55. Does it feel as if someone else were controlling your emotions and feelings?
56. Have you been seeing imaginary things?
57. Have you felt as if some of what you have been doing is really not your doing at all?

IV. Meaning Change Scale — 6 items

13. Have you felt that certain things were especially clear to you or that you understood them better?
14. Have you seen new connections between certain events or experiences that you hadn't seen before?

Table 1 (Continued)

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- 23. Have you felt that during the experience you have acquired any new power or ability?
 - 29. Has any particular thing fascinated you-held your attention so that you found it hard to leave it?
 - 39. Have certain objects or other things taken on meanings they never had before?
 - 46. Do you think that your judgement and ability to evaluate are better than usual?

V. Affect Change Scale — 5 items

- 15. Have you felt depressed or sad?
- 17. Have you been especially happy?
- 18. Have you been feeling silly?
- 31. Have you been afraid or upset?
- 42. Have you felt angry or annoyed?

VI. Body Image Change Scale — 10 items

- 5. Have you felt somehow as if you were merging or melting into your surroundings?
- 11. Have you found it easier to move than usual?
- 16. Has your body looked or felt strange in any way?
- 21. Have you felt like a child?
- 27. Have you felt as if you were standing aside and watching yourself?
- 28. Have you felt like an old person?
- 30. Has it felt as if some part of your body was disconnected or somehow didn't belong to the rest of your body?
- 49. At times have you felt like a different person?
- 71. Has your body felt light or like it was floating in space?
- 72. Has your body felt heavier than usual?

VII. Somatic Change Scale — 11 items

- 60. Have you had any dizziness or grogginess?
- 61. Have you had any numbness or tingling?
- 62. Have you had any chills or a cold feeling?
- 63. Have you felt hot or been sweating?
- 64. Have you had a funny taste in your mouth?
- 65. Have you smelled any unusual or heightened odors?
- 66. Have you felt nauseous?
- 67. Have you had blurred vision or trouble focusing your vision?
- 68. Has your mouth been dry or have you had less saliva than usual?
- 69. Have you felt pressure or ringing in your ears?
- 70. Have you felt weak physically?

VIII. Total Scores — (all above + 2 items-67)

- 35. Have you felt you would rather not talk?
- 59. Are you unsure of how I am reacting to you?

Other items

- 2. Do I look different than I usually do?
- 3. Do the objects about you look different in any way?
- 20. Have you been thinking about things you don't usually think about?
- 37. Have you been talking more than usual?

Table 2. Frequency of endorsed items in each experimental condition
($N = 14$ for each condition)

No.	HD	PD	D	HT	PT	No.	HD	PD	D	HT	PT	No.	HD	PD	D	HT	PT
1	13	9	10	11	2	27	10	8	7	9	6	51	9	6	5	9	6
2	8*	3	5	5*	0	28	7	5	3	4	2	52	7	3	2	2	0
3	9*	4	5	4*	0	29	9	7	9	8	5	53	8	7	3	6	3
5	14	12	7	11	0	30	9	4	4	5	1	54	8	6	4	2	2
7	13	9	10	11	6	31	11	10	4	7	8	55	9	4	2	6	2
8	9	7	6	6	6	32	8	8	4	4	3	56	9	5	2	3	1
9	6	4	3	7	2	33	10	8	6	6	3	57	9	6	6	4	2
10	9	6	6	8	0	34	9	4	2	6	3	58	11	8	9	7	6
11	3	4	3	4	0	35	7	3	7	2	5	49	10	7	6	5	5
12	7	4	7	5	6	36	8	4	6	6	6	60	6	7	3	2	1
13	13	14	9	13	11	37	9	11	2	9	10	61	12	8	9	6	2
14	13	14	7	12	12	38	11	7	7	4	2	62	9	8	6	4	1
15	13	12	8	13	9	39	8	5	4	7	5	63	8	3	7	3	2
16	13	12	12	9	2	40	13	11	8	9	9	64	10	6	5	5	0
17	8	6	5	2	0	41	6	8	5	7	2	65	1	0	3	2	0
18	10	9	10	1	2	42	11	9	6	7	9	66	6	4	3	1	2
19	8	2	4	0	1	43	11	3	3	5	1	67	9	6	9	6	0
20	13	13	9	13	12	44	9	5	4	5	3	68	7	6	5	9	2
21	12	6	7	4	2	45	12	7	2	4	1	69	9	5	5	4	1
22	7	4	7	5	4	46	8	8	2	12	7	70	8	6	5	1	1
23	11	8	3	11	7	47	3	2	4	0	0	71	13	11	8	8	0
24	8	3	4	10	2	48	12	8	8	7	6	72	8	5	6	7	1
25	7	2	8	4	1	49	13	11	7	10	7	73	10	7	7	2	2
26	9	4	6	5	4	50	10	9	5	6	5						

* Several subjects were not tested on the specific item, giving an N less than 14.

c) *Delic Condition (D) = LSD*. Each S was given 2 $\mu\text{g/kg}$ LSD orally at the start of the session and then told that he was to work on his problems by himself. The S was provided with a pad of paper and a pencil should he desire to do some writing. Although the E remained in the room and periodically observed the S , verbal interchange was minimal.

d) *Hypnotherapy Condition (HT) = Hypnosis + Psychotherapy*. Except for the fact that S s were not given LSD, the procedure was similar to that described for HD above.

Table 3. Comparison of items which differentiate significantly among the five treatment conditions and baseline

Item	HD			PD			D			HT			D			PD			HD			D HT PT B			HT PT B			PT B		
	PD	D	HT	PT	B	PD	D	HT	PT	B	PD	D	HT	PT	B	PD	D	HT	PT	B	PD	D	HT	PT	B	PD	D	HT	PT	B
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3				+	+																									
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Key: + = $p < .05$ based on two-tailed test for significance.

e) *Psychotherapy Condition (PT) = Psychotherapy*. Although Ss were neither given LSD nor hypnotized, an insight-interpretive form of psychotherapy was employed during the session. As in the HD, PD, and HT conditions, much of the information obtained in the previous psychiatric interview was used for the therapy session.

In no instance were Ss told what drug they would receive. Although Ss were required to sign a voluntary consent form before they could participate in the study, they were told that they might or might not receive the "experimental drug" during the treatment session.

A total of 70 patients participated in the study, and each of the five groups was composed of 14 Ss (8 male, 6 female). Since the peak effects of LSD have been reported to occur one and one-half to two hours after oral administration (ABRAMSON et al., ISBELL et al.), the modified Linton-Langs Questionnaire was administered again (3rd testing) approximately two hours after the start of the session. This procedure was followed not only for the three LSD conditions, but for the HT and PT conditions as well.

Results

In this report, questionnaire scores obtained during the 3rd testing will be compared for the five different treatment conditions. Scores obtained in each treatment condition will also be compared with baseline (B) scores (1st testing).

A. Individual Item Analyses

The frequency of endorsed items for each of the five conditions is given in Table 2. An exact chi square analysis (TATE and CLELLAND) revealed a large number of items which differed significantly in the frequency of endorsement among possible pairs for the five conditions (Table 3). A similar comparison among the five groups during the baseline condition revealed only six comparisons out of a possible 710 which differed significantly. This is well below the number expected by chance at the .05 level of significance.

Table 4. *Number of items which differentiate significantly ($p < .05$) among conditions and baseline*

	PD	D	HT	PT	B
HD	2	12	9	35	26
PD		4	1	14	16
D			4	10	10
HT				9	4
PT					1

The Related Samples Proportions Test (TATE and CLELLAND) was used to calculate the statistical significance of the difference in frequency of endorsed items for each condition compared to that obtained for the baseline (see Table 3). The number of items which significantly dif-

Table 5. *Median and range values of scales during treatment conditions and baseline*

Scales	HD	PD	D	HT	PT
Altered Thinking	7.83 (4-12) 2.50 (0-7)	6.50 (0-11) 1.50 (0-10)	5.50 (0-13) 1.00 (0-9)	4.16 (0-12) 3.00 (0-12)	2.50 (0-9) 2.83 (0-8)
Time Sense	2.93 (1-4) 1.90 (0-3)	1.50 (0-3) 1.00 (0-3)	2.16 (0-4) 1.00 (0-2)	1.50 (0-4) 0.83 (0-3)	0.50 (0-3) 1.50 (0-3)
Loss of Control	10.83 (4-15) 2.00 (0-11)	6.83 (1-13) 0.75 (0-3)	4.00 (0-13) 0.50 (0-13)	4.16 (0-15) 1.83 (0-14)	2.00 (0-6) 1.50 (0-8)
Meaning Change	4.90 (1-6) 0.70 (0-4)	4.07 (2-6) 1.25 (0-4)	1.50 (0-6) 1.90 (0-4)	4.50 (0-6) 2.00 (0-6)	3.50 (0-6) 2.00 (0-5)
Affect Change	3.90 (2-5) 1.50 (0-2)	3.16 (1-5) 0.83 (0-2)	2.50 (0-5) 0.70 (0-3)	2.50 (1-3) 1.30 (0-4)	2.16 (0-4) 1.94 (0-4)
Body image Change	7.25 (4-10) 2.00 (0-8)	6.00 (1-9) 0.83 (0-5)	4.50 (0-9) 1.00 (0-6)	5.00 (1-10) 2.25 (0-7)	1.70 (0-4) 1.50 (0-8)
Somatic Change	6.00 (2-10) 2.16 (0-8)	4.00 (0-8) 0.37 (0-6)	5.50 (0-8) 0.50 (0-4)	2.50 (0-10) 0.90 (0-3)	0.37 (0-4) 2.10 (0-6)
Total Score	44.50 (26-62) 15.50 (2-39)	34.00 (11-54) 11.75 (2-24)	25.00 (4-55) 8.00 (0-38)	27.50 (8-61) 15.00 (0-51)	15.00 (3-33) 15.00 (0-36)

Key: Value in upper part of each cell is for condition and lower part of each cell for baseline.

ferentiate among the various conditions and which differentiate between the conditions and the baseline measure is presented in Table 4.

B. Scale and Total Score Analyses

Median and range values for all modified Linton-Langs Questionnaire scale and total scores for the five conditions and baseline are presented in Table 5. With the exception of the Affect Change scale, Kruskal-Wallis one way analysis of variance showed that the values obtained for the various questionnaire scales did not differ significantly among the five groups of Ss in the baseline condition. However, statistically significant differences were demonstrated for all scales and total scores during the five treatment conditions (see Table 6).

Table 6. *Kruskal-Wallis one way analysis of variance among the five conditions and during baseline*

Scales	Baseline		Conditions	
	K-W Value	* <i>p</i> less than	K-W Value	* <i>p</i> less than
Altered Thinking	3.6	N.S.	10.9	.05
Time Sense	3.2	N.S.	17.7	.005
Loss of Control	7.9	N.S.	23.6	.001
Meaning Change	3.0	N.S.	12.0	.02
Affect Change	11.4	.05	16.5	.005
Body Image Change	6.2	N.S.	27.9	.001
Somatic Change	7.2	N.S.	25.9	.001
Total Score	4.5	N.S.	24.6	.001

* *p* Values based on two-tailed test for significance.

The Wilcoxon T Test (TATE and CLELLAND) was employed to measure the differences between each of the groups, taken two-at-a-time, for each of the questionnaire scales. The statistical significance of the difference between scale scores obtained in each condition and those obtained in the baseline condition was calculated by means of the Wilcoxon Paired Replicates Test (TATE and CLELLAND). Results of these analyses can be seen in Table 7.

C. Scale and Total Score Correlations

In a previous report (LUDWIG and LEVINE, b), it was shown that an individual's baseline scores correlated significantly with his scores when hypnotized. In order to analyze whether a similar relationship existed for the experimental conditions, Pearson Product Moment Correlations were calculated between the baseline and each condition (HD, PD, D, HT, PT) on the scales and total scores. The results of these analyses can be seen in Table 8.

Table 7. *Significance values of scale and total score comparisons among the various treatment conditions and baseline*

Table 7. Significance values of scale and total score comparisons among the various treatment conditions																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Except for five significant correlations, most scale scores in the PD, D, and PT conditions did not correlate significantly with the baseline scale scores. The HT condition revealed four statistically significant correlations with baseline scale scores, while the HD condition revealed none. Total questionnaire scores revealed significant correlations in only the PD and HT conditions.

Table 8. *Product-moment correlations between baseline and each condition for scale and total scores*

Scales Conditions	I	II	III	IV	V	VI	VII	Total
HD	.369	.255	-.097	.382	-.241	.371	.076	.138
PD	.645*	.322	-.186	.048	.432	.626*	.276	.603*
D	.140	.663**	.242	.430	.216	.439	-.368	.333
HT	.838**	.794**	.713**	-.096	.496	.506	.774**	.837**
PT	.359	.333	.074	.092	.276	.560*	.787**	.360

Key: **p* less than .05. — ***p* less than .01 two-tailed test for significance.

Discussion

Although hallucinogenic drug and hypnotic states are considered to represent altered states of consciousness, most discussions of the so-called alteration have been based more on theoretical considerations than on data accumulated from controlled, experimental procedures (BRENMAN; KLEIN; RAPAPORT). These theoretical formulations view alterations of consciousness in qualitative terms and employ such conceptual schema as patterns of thought organization, the quantity and quality of available cathexes, the relative predominance of archaic modes of thought, reflective awareness, and so on, to characterize the particular state of consciousness discussed. Unfortunately, many of these theories cannot be studied experimentally since the concepts employed to describe consciousness and its alterations are often more controversial than the state which they attempt to explain or describe.

Regardless of the disagreement and confusion surrounding the use of the term "alteration of consciousness", it can be a useful construct—provided the person talking about it specifies what aspects he is referring to or trying to measure. Although many types of measuring instruments might be employed (such as the EEG, MMPI, IQ tests, perceptual and motor tests), the present study is concerned with evaluating consciousness and alteration in consciousness mainly in terms of subjective experience and change in subjective experience by means of a questionnaire technique.

There are many factors which have to be taken into account in any appraisal of subjective response. GUILFORD and GUILFORD claim that the

S may respond (a) without representing exactly what the question implies in its most obvious meaning, (b) impulsively and without real insight as to the real meaning of the question, (c) in accordance with the expectations of the experimenter, (d) by attempting to be self-consistent in his answers. HAERTZEN mentions some additional confounding variables, and goes on to say that "the process involved in willingness to admit or not to admit to symptoms, transcends specific item content to a certain extent and has a considerable significance since the process determines a portion of the correlation between scales entirely aside from the actual meaning of items".

Although methodological and conceptual problems abound in any study dealing with subjective experience, the major difficulty is that no objective criteria are available to measure the validity of a person's response. Simply asking someone what he is feeling is no guarantee that he actually feels what he admits he is feeling. However, this conceptual problem can be dealt with in a practical manner by disregarding the problem of the "reality" of the subjective experience and measuring instead whether *Ss* tend to answer more of certain types of questions in a particular way in an "experimental" condition compared to a "control" condition. BEECHER (1952, 1959), for example, does not attempt to dissect away the "real" from the "unreal" of the subjective experience but chooses to deal only with the subjective response which he considers to represent the resultant of the action of the original stimulus and the psychic modification of that stimulus. With this as his operational approach, BEECHER has demonstrated that the questionnaire technique, despite its limitations, can be reliably employed as a practical tool to measure quantitatively the differential subjective effects of certain drugs, agents or procedures.

Operationally, we chose to define a baseline waking state for each person by the number and kind of questions endorsed following a one and one-half hour psychiatric interview. Alteration in consciousness refers to the change in the number and kind of questions endorsed by individuals when exposed to procedures or maneuvers designed to influence consciousness.

Turning now to the results, we find that the frequency of endorsement of a large number of items differs among the conditions. Although comparison of the HD and PD condition reveals only two items in which the frequencies differ significantly, the HD condition shows a greater endorsement of items throughout the questionnaire. When total questionnaire scores are considered, the differences between HD and PD become quite apparent.

On the basis of chance alone (employing the .05 level of probability), a Type I sampling error might be expected to occur in approximately

4 of 73 items when differences between any two conditions are analyzed for statistical significance. Assuming that any four of the total significant items in a given comparison might represent artifact, inspection of Table 4 reveals that the five conditions and baseline responses can be differentiated from each other as follows:

- a) HD is $\approx$ PD and $>$ D, HT, PT, B
- b) PD is $\approx$ D, HT and PT, B
- c) D is $\approx$ HT and $>$ PT, B
- d) HT is $\approx$ B and $>$ PT
- e) PT is $\approx$ B

Scale analyses helped provide an even clearer picture of the differences among the conditions. The HD condition, by far, gave rise to the greatest alteration in consciousness. Subjects in the HD condition admitted to much greater loss of control and body image change than in all other conditions and differed in distortion of time sense, altered thinking, and somatic change scales from subjects in three of the four other conditions. Total scores, which we conceptualize as being directly related to the degree of alteration of consciousness, were significantly greater in the HD condition compared to all other conditions.

It was somewhat surprising to find that the PD, D, and HT conditions could not be statistically differentiated from one another on the basis of scale and total score analysis, even though these conditions could be differentiated from PT and baseline scores on many of the scales and total score. This lends some support to GUBEL's claim that the subjective experiences of LSD and hypnosis are similar. The PT condition showed little difference from baseline measures.

On the basis of both individual item and scale analysis, we conceptualize the degree of alteration in consciousness among these five conditions, going from the greatest to lowest alteration, as follows:

$$HD > (PD \approx D \approx HT) > (PT \approx B).$$

Thus, the HD condition produces the most profound alteration of consciousness. Although LSD, with or without therapy, does not differentiate from HT, it appears that when hypnosis is added to LSD or when LSD is added to hypnosis, a more profound subjective effect occurs.

Summary

This study was designed to measure the alterations in consciousness produced by combinations of LSD, hypnosis and psychotherapy. Five groups of 14 patients were given the modified Linton-Langs Questionnaire during baseline and treatment conditions. The results indicated that the hypnodelic condition (LSD + Hypnosis + Psychotherapy) caused the greatest alteration in consciousness and could be statistically

differentiated from all other conditions on scale and total questionnaire score measures. The Psychedelic (LSD + Psychotherapy), Delic (LSD) and Hypnotherapy (Hypnosis + Psychotherapy) conditions could not be distinguished well from one another but differed significantly from the Psychotherapy condition and baseline measures.

Acknowledgements. The authors are grateful to Dr. HARRIS ISBELL, former Director, NIMH Addiction Research Center, USPHS Hospital, Lexington, Kentucky, for supplying the LSD and serving as an advisor on drug effects. The authors also wish to express their appreciation to Dr. JONATHAN O. COLE, Chief, Psychopharmacology Service Center, NIMH, for making available data processing facilities. We are also indebted to Doctors RONALD BONATO, Director, CHARLES E. RICE, Assistant Director and the staff of the Biometrics Laboratory, George Washington University, Washington, D. C., for consultation and aid in performing some of the statistical analyses.

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