Comparison of the LSD-25 Experience and Delirium Tremens

KEITH S. DITMAN, M.D., and JOHN R. B. WHITTLESEY, M.S., Los Angeles

Introduction

Recently psychiatry has had a renewed interest in drugs with "hallucinogenic" properties. New ones are being made, or extracted from plants, at a rapid rate. These drugs are being used more and more widely in treatment and in psychodynamic investigations. We are struck by the many claims that have been made about these psychopharmacological agents and, in particular, have noted the varied and often contradictory descriptions of their psychic effects—effects which have been labeled "experimental schizophrenia," "model psychosis," "toxic delirium," and so on. In this paper our interest in lysergic acid diethylamide, or LSD-25, is not particularly in its value in psychotherapy, or with its use as an agent for investigation of psychodynamics. Rather, our interest is in developing an objective method for studying the subjective aspects of these experiences. We have sought a method which would not interfere with the experience, or be interfered with by the experience—one in which the subject could express and describe what he had undergone in a manner that could be quantified, studied, and compared with other experiences of marked changes of consciousness, such as the delirium tremens. We choose the card-sort technique because it allows a less verbal subject to express himself with less of a handicap, and because cards lend themselves more readily to quantification than do narrative accounts, which would have been the more likely alternative. Thus, our card sort is a report of a recalled change of consciousness, a subjective experience reported in a prescribed manner.

Submitted for publication Aug. 22, 1958.

Lysergic acid diethylamide (LSD-25) was supplied by Mr. Harry Althouse, of Sandoz, Inc., San Francisco.

Read before the 114th Annual meeting of the American Psychiatric Association, San Francisco, May 16, 1958.

Alcoholism Research Clinic, Department of Psychiatry, University of California at Los Angeles Medical Center.

This research was supported by a grant from the Division of Alcoholic Rehabilitation, State of California Department of Public Health.

The computations involved were made with the assistance of the IBM facilities of the Western Data Processing Center, Graduate School of Business Administration, University of California at Los Angeles.

Methodology

This card sort consists of 300 statements, one to a card. The statements are designed to cover as many aspects of the LSD and delirium tremens experience as possible. The items were taken from the LSD literature, subjects, delirium tremens patients, and suggestions from colleagues. Also included are items that would be expected to describe aspects of psychotic experiences. The statements are phrased in the present tense to help the subject in recalling his experience. Examples of these statements follow.

"I feel anxious or fearful."
"Colors around me seem brighter."
"Others seem to be controlling my thoughts."
"Everything somehow seems more real."
"I see people or animals in motion who aren't really there."
"I feel depressed."
"Opposites seem to be related in strange paradoxical ways."

The subject was instructed to describe his experience by sorting the cards into five piles, ranging from a discard pile for these items that did not apply at all, to a top pile consisting of items that best described the most outstanding part of his experience. After he had sorted the cards into these five piles, the subject was asked to select from the top pile 10 or less cards which caught

the very essence of his experience. This "top of the top" pile then became the sixth pile.

The LSD population consisted of 70 subjects, ranging in age from 25 to 65 years. Fourteen of them were women. We classed these subjects as normals, intellectuals, neurotics, "white-collar" alcoholics, "Skid-Row" alcoholics, and non-drinking Alcoholics Anonymous members. The 20 delirium tremens subjects were "Skid-Row" alcoholics, and 8 of these patients were subsequently given LSD. Card sorting by the subjects was generally done from one to seven days following their LSD experience, usually within five days. The delirium tremens sorts were obtained anywhere from a few days to two years following the delirium tremens experience. The effect of this delay was investigated by comparing the sorts obtained within two months with those delayed by more than six months. The difference found does not significantly affect the results in this paper. Repeat sorts were done with some LSD subjects in order to calculate reliability coefficients, which averaged in the low 70's, a quite satisfactory value.

Not all the LSD subjects were supervised by us directly; some were subjects of other investigators in the area. However, most of these LSD subjects took the drug in groups of three to five persons, and were in a protective, supportive, and permissive environment, where they had an opportunity to experience music and art, and in some cases had a chance to sit quietly in the dark, walk in a garden, etc. They all received a standard 100μg. dose orally.

Data Analysis

The accompanying figures show results which were obtained to a large extent on an IBM-650 magnetic drum digital computer. Calculations were made possible by arbitrarily assigning the values zero through 5 to the six card piles. In these figures mean values are plotted for the individual items, obtained by averaging scores from the card sorts of a number of different subjects. These mean values actually show only a part of the data, as each of the points on the graphs represents the mean of a distribution of an entire set of discrete values, distributions which merge and overlap to a degree that would be impossible to show on such a diagram. Standard deviations and t-scores were obtained for these many distributions; and, although these are not directly mentioned in any of the results which follow, indirect note is taken of them in our delineation of the gray areas in the Figures. These gray areas have been so chosen that they exclude all points whose t-scores would be expected to lie above chance at the 1% level of significance.

We have classified the 300 items into 18 categories for presentation on these slides. To arrive at these categories, a combination of two methods was used: (1) an inspection of the content of the items from a psychiatric orientation and (2) inspection of the way in which the items were picked by certain clusters of persons. Sometimes, also, a group of items, selected by one cluster of persons, would, upon inspection of their content, be further subdivided into two or more categories.

Results

Figure 1 shows a scatter diagram comparing the average card-sort responses from 70 LSD subjects with the responses from 20 delirium tremens patients. Each of the 300 points on the graph represents one of the statements in the card-sort. The vertical distance to the point gives the average LSD score for that item, and the horizontal distance gives the average delirium tremens score. The legends along the vertical and horizontal axes relate the piles in the card sort to these distances, the top pile for the LSD experience being in the upper left, and the top pile for the delirium tremens experience being in the lower right. The discard pile is represented in both cases by the zero point, or origin.

Figure 2 shows a theoretical scatter diagram with all the points lying in the region shown in gray, which would be the case if both groups (LSD and delirium tremens) had had essentially the same experience.

If, on the other hand, the two experiences were completely dissimilar, one would expect a graph, as shown in Figure 3. Here there are but few points in the gray area except near the origin, while the majority of points lie close to the horizontal and vertical axes.

Returning now to Figure 1, we observe a situation midway between the state where the two groups have had the same experience

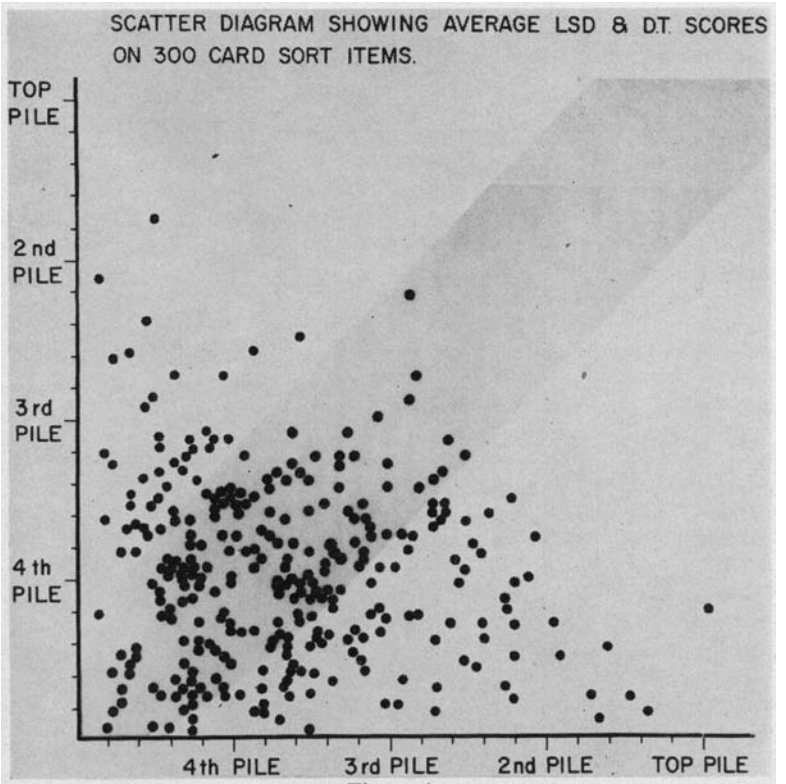

Figure 1

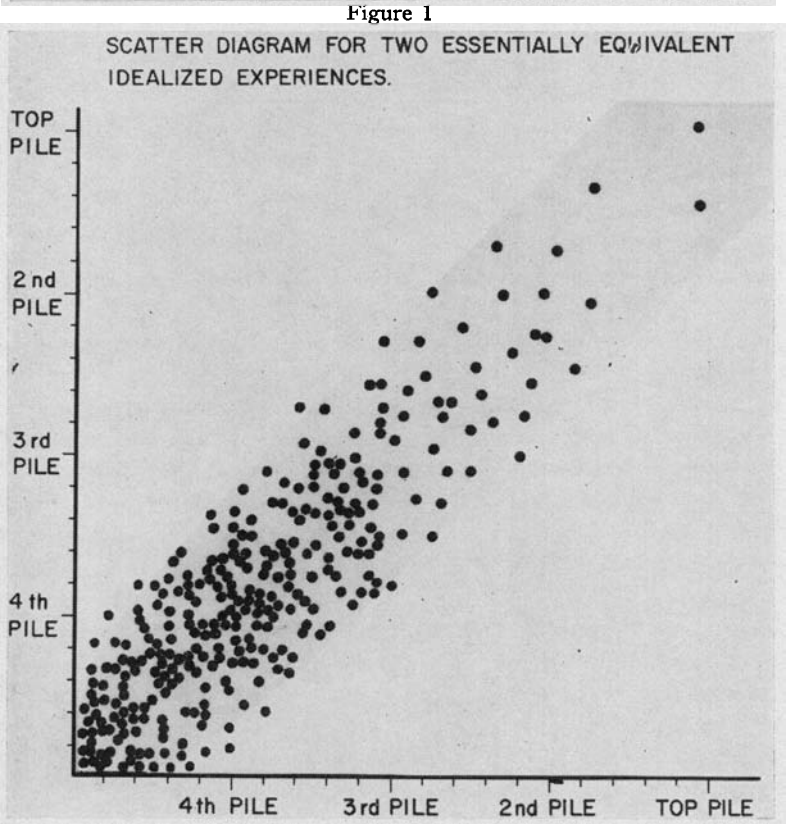

Figure 2

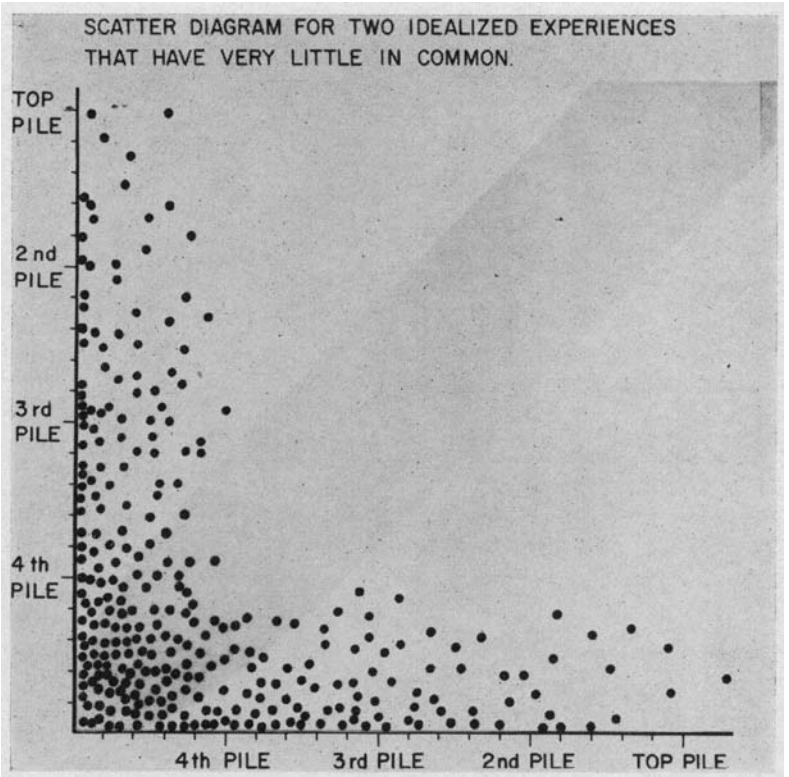

Figure 3

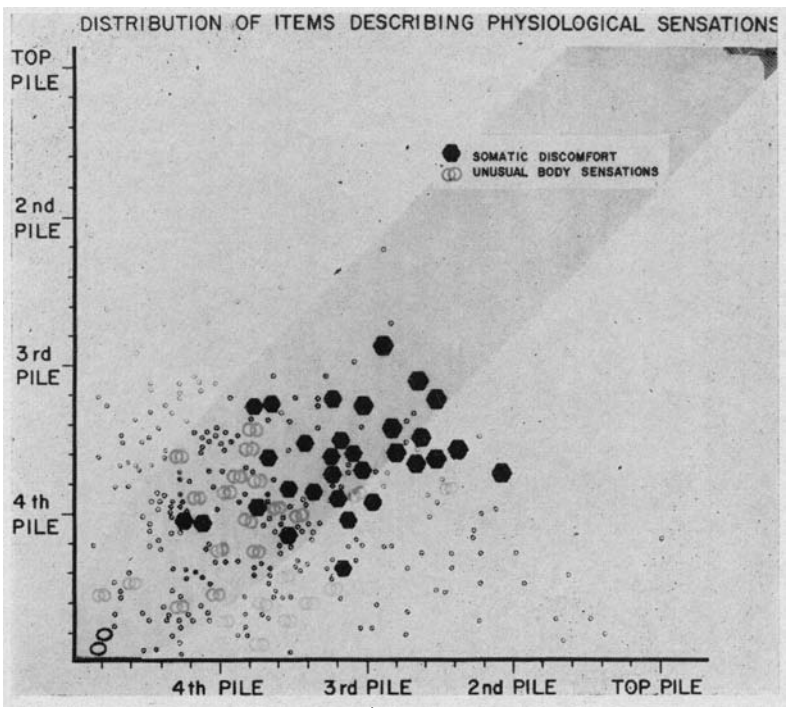

Figure 4

and the state where the two groups report very different experiences.

There are items near the vertical axis which are scored much higher on the average by the LSD than by the delirium tremens subjects. There are other items which appear primarily in the delirium tremens region along the horizontal axis, and there are items in the upper part of the gray region. These items are scored high by both groups. However, there are virtually no items which were picked solely by one group, to the exclusion of the other.

The next six Figures contain the same points that are plotted in Figure 1, except that symbols are substituted for some of the black dots. These symbols refer to the 18 categories into which we have classified the 300 items.

In Figure 4 the hexagons denote items classified in the category "Somatic Discomfort," while the horizontal interlocking circles represent the category "Unusual Body Sensations."

The "Somatic Discomfort" category includes sensations such as dizziness, shakiness, nausea, malaise, sweats, chills, headaches, and restlessness. A typical item reads: "I feel somewhat ill."

The "Unusual Body Sensations" items differs from the "Somatic Discomfort" items in that they are strange rather than uncomfortable. They include feelings of lightness, distortion of body scheme, loss of control over body and feelings, unusual sensations, and so on. Typical items are "I feel like I am floating in space," and "Parts of my body don't seem to belong to me."

These items are equally characteristic of both LSD and delirium tremens subjects, as evidenced by the fact that they lie centrally.

In Figure 5 the chevrons represent items in the "Thoughts, Recollections" category, and the letter *I*'s are items in the "Hypnagogic" category.

In the "Thoughts, Recollections" category are items which imply an upsurge of thoughts, recollections, some feelings in re-

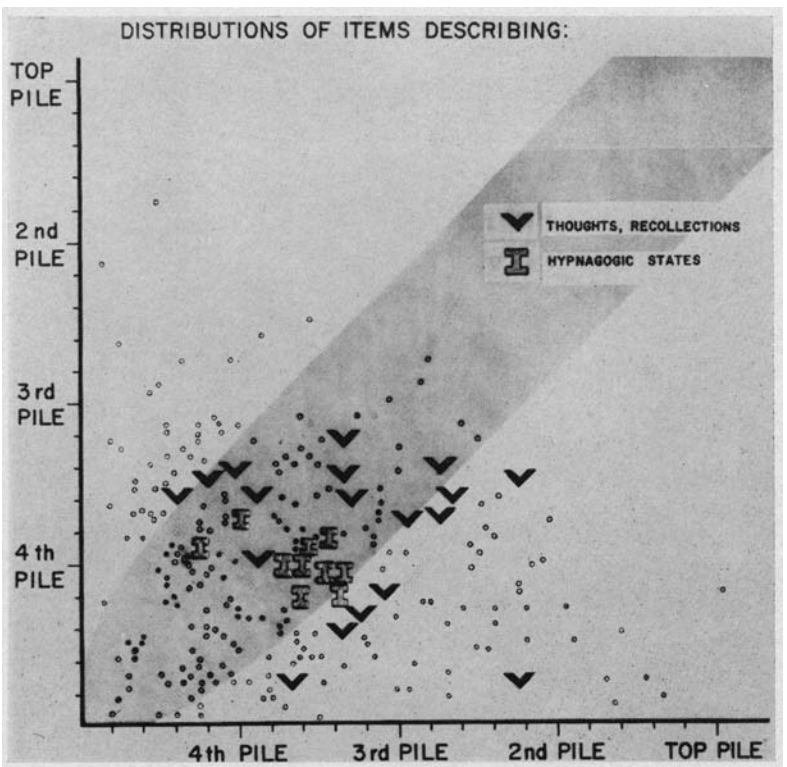

Figure 5

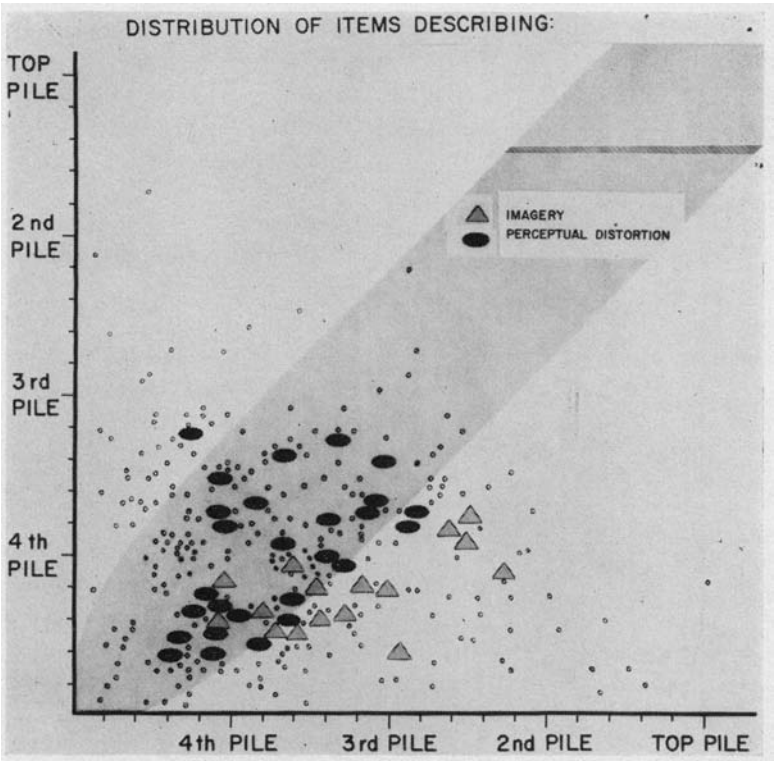

Figure 6

lation to past experiences, and difficulties encountered in verbalizing all that is happening. Examples of items in this category are "I have very vivid recall of scenes and emotions from days gone by" and "Ideas are forming so fast I can't state them all."

In the "Hypnagogic" category are items that imply loss of alertness, sleepiness, drowsiness, dreaminess, and impaired thinking. A typical item in this category is "I feel as if I were in a dream."

As in Figure 4, these items are equally as descriptive of LSD as of delirium tremens.

In Figure 6 a slight separation between the scoring by the LSD and the delirium tremens subjects begins to appear.

The upright triangles represent the "Imagery" category, which includes visual afterimages, synesthesiae, "internalized" visual images, vivid visual fantasies, and so on.

The ellipses represent the "Perceptual Distortion" category, which includes such effects as colors seeming to become brighter, distortion of sense of distance, objects appearing fluid or superimposed on themselves or changing in shape, distortion of hearing, and distortions in time sense.

The distinction between these categories is illustrated by some typical items: from the "Imagery" category, "With my eyes closed I see multicolored moving designs"; and from the category of "Perceptual Distortion," the items "Other people's faces seem to have become changing masks," and "Certain objects suddenly stand out."

As can be seen from the location of the symbols, the "Imagery" category is rather more representative of the delirium tremen's subjects, while the "Perceptual Distortion" category is relatively more characteristic of the LSD experience.

In Figure 7 the vertical bars refer to items of the "Alertness" category, which includes a subjective sense of feeling more alert mentally, of seeing more intensely, hearing more acutely, having the subjective sensation

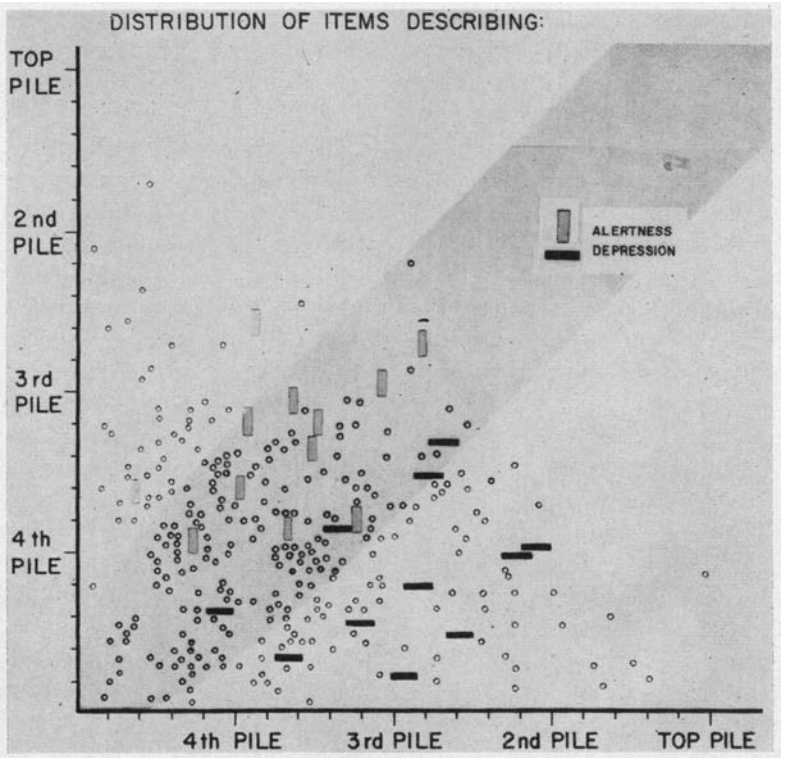

Figure 7

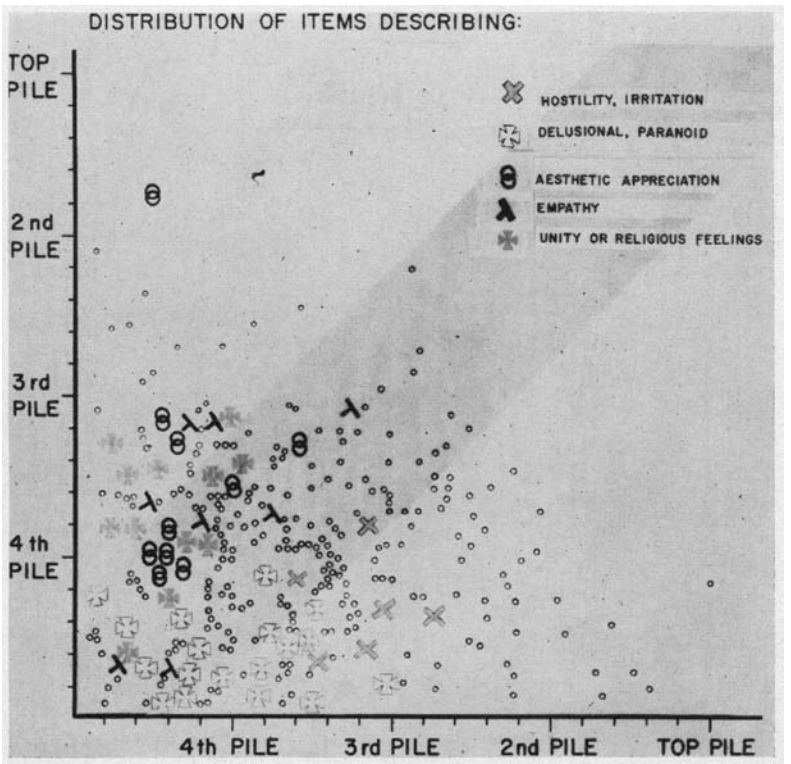

Figure 8

that one's mind is improved, and remembering very clearly what happened.

The horizontal bars refer to items of the "Depression" category, which indicate feelings of depression, guilt, sadness, dislike of self, thoughts of death, and so on. Typical items are "I feel very guilty over things I've done in the past" and "Everything seems hopeless."

As can be seen, the "Alertness" items are neutral, while the "Depression" items are more representative of the delirium tremens group.

In Figure 8 there appears a separation between the types of items selected by the LSD and those by the delirium tremens subjects.

In this figure the crosses refer to a category we have called "Hostility, Irritation," and the light Maltese crosses refer to the "Delusional, Paranoid" category. In contrast to these are the vertically interlocking circles, representing the category called "Aesthetic Appreciation"; the lambdas, for a category we have called "Empathy," or, more correctly, "Human Closeness," and the dark Maltese crosses for one we have called "Unity or Religious Feelings."

The "Delusional, Paranoid" category includes delusional ideas, feelings of depersonalization, grandiose thoughts, persecutory feelings, suspiciousness, etc. A typical item is "People are talking about me." The "Hostility, Irritation" category includes hostility, irritation, annoyance with others, desire to be alone, etc. An item is "Why can't those people stop bothering me?"

"Aesthetic Appreciation" includes items about an increased enjoyment of music and art, an appreciation of serene beauty and of new values, together with a sense of quiet meditation. An item from this category is "I want to just sit and keep looking at an object for hours on end."

The category "Empathy," "Human Closeness," includes items expressing the desire to relate to others, wishing to be with others, feeling interested in others, understanding

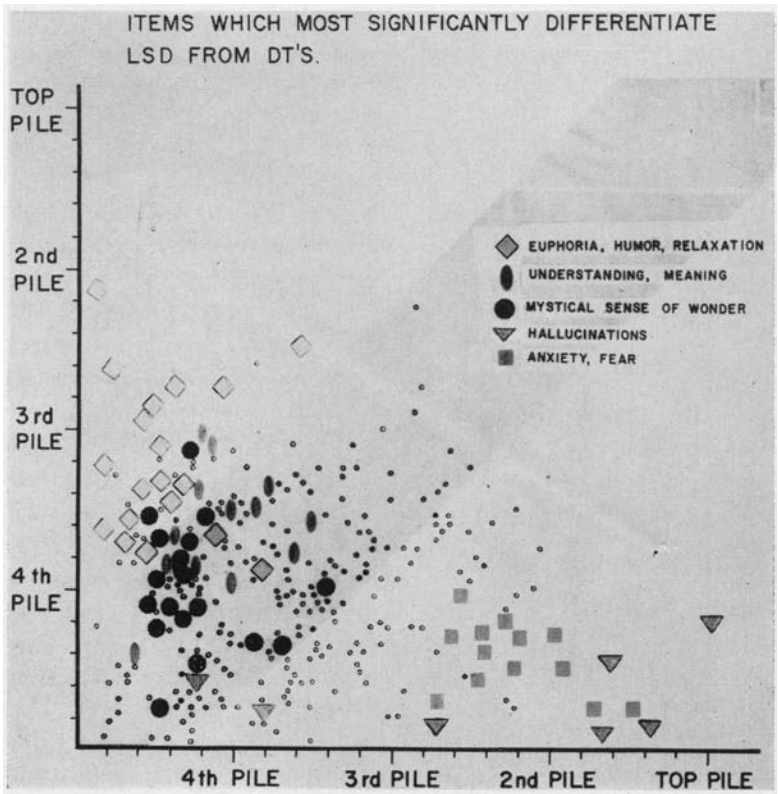

Figure 9

and being understood by others, etc. A typical item is "I feel at one with the people around me."

"Unity or Religious Feelings" includes items that describe feelings of a oneness of all, of a presence of God, of a reconciliation of opposites, and of a new over-all interrelatedness of things. It includes many of the items which would fit into the definitions of the mystic as given by William James, in his "Varieties of Religious Experience" and by Bertrand Russell in his essay on "Mysticism and Logic." A typical item is "Everything is exactly right just at it is."

Figure 9 shows the last group of our categories which most markedly distinguish the LSD and delirium tremens responses. The diamonds represent the "Euphoria, Humor, Relaxation" category; the upright ellipses represent a category we have called "Understanding, Meaning" and the solid disks represent a category called "Mystical Sense of Wonder." These three lie opposite to the categories represented by squares for "Anxiety, Fear," and downward-pointing triangles, which represent auditory, visual, and tactile "Hallucinations," which seemed real.

Typical items for these categories are as follows: for "Hallucinations," "I see faces or little animals coming out of the walls," and "I see and hear things happening which couldn't be happening and yet they seem very real"; and for "Anxiety, Fear," "I seem to be on the fringes of sheer horror," and "I feel something dreadful is about to happen." The "Understanding, Meaning" category includes items in which the subject feels he has gained some insight or further understanding of himself, others, things, or ideas. For example there is the item "I seem to be seeing myself as I really am." The "Mystical Sense of Wonder" category includes those experiences in which there was a sense of sudden insight into the depths of truth, revelations, illuminations, and significances, as, for example: "Only now do I really see the point of existence." Finally, the fifth category, "Euphoria, Humor, Relaxation" includes such items as "I feel exhilarated," "Everything seems delightfully funny," and "I feel a sense of relaxation, and a lack of urgency about doing anything."

A comparison was also made between the responses of all the alcoholic LSD subjects with all the nonalcoholic LSD subjects.

The main difference found was that the alcoholics tended toward a more uncomfortable reaction. They picked more "Somatic Discomfort" and "Depression" items, such as feeling restless, shaky, unsteady, and upset, and likened the experience to being drunk, "high," having a hangover, and being in need of a drink. They also had feelings of remorse and of a wasted life. One of the items which was picked significantly higher by them than by the nonalcoholics was "All this seems to have happened to me before"; and the one item out of the 300 which was far and away the most differentiating item between the two groups is "I feel like I do when I need a drink."

The nonalcoholics, in contrast, tended more toward items from the "Appreciation, Aesthetic," "Mystical Sense of Wonder," "Imagery," "Unity and Religious Feelings" and "Perceptual Distortion" categories. These included such items as "I want to just sit and keep looking at an object for hours on end," "With my eyes closed I see multicolored moving designs," "The folds and textures of cloth have become rich and wonderful to look at," "Colors around me seem brighter," and "The patterns and colors I find in objects and walls fill me with an amazed wonder and gratitude by their mere existence."

Eight of our delirium tremens subjects were later given LSD and also sorted the cards to describe that experience. The comparison of this subgroup of LSD and delirium tremens experiences was found to be, in general, similar to the comparison of the larger LSD and delirium tremens populations. The 300 items had approximately the same distribution of mean scores for the two groups. In the smaller group there was a little more dispersion of the

categories, a finding which is in keeping with the smaller number of subjects. In this smaller group the "Somatic Discomfort" and "Depression" categories tended more toward the LSD area, while the "Imagery" category was more in the delirium tremens area. The all-alcoholic population comprising this subgroup might account for the shift.

Comment

To use subjective reports for a study of changes of consciousness is at once highly intriguing, difficult, and problematical. When the attempt is made, as we have done with a card sort which purports to describe a recalled change of consciousness in a prescribed and quantifiable manner, two types of difficulties arise. First, as with any psychological instrument, there is the question of validity. To what extent do the subjects forget what they experienced, and how suggestible are they? To what extent do they pick items merely to please the investigator, or so as not to appear too different from what they view as the norm? Further, when it is impossible to maintain identical settings and environments in the two experiences under comparison, to what extent are the differences due to the setting, and to what extent are they due to the drug or other etiologic agent? Preliminary findings obtained using another drug (JB336, Lakeside Laboratories, Inc.) has lessened our concern over this last point with respect to the LSD-delirium tremens comparison. This newer drug seems to approximate far more closely the delirium tremens pattern than does LSD, even when it is administered in a setting similar to that which was obtained for our LSD subjects.

The second difficulty lies in the variability of these states of consciousness. The LSD experience is really not one, but many, experiences, as is the delirium tremens. We have subdivided our LSD subjects into a number of groups and find that various clusters of people have predominantly one kind of experience or another. Thus, there are some people who have primarily a euphoric experience, others who have a visual image type of experience, and still others who obtain mainly somatic discomfort and depression from the drug. To discuss adequately the various clusters of people having different types of experiences is a subject in itself, which we hope to develop in a later paper. We can take time only to note that for many items there is fully as wide a spread in the responses from the different LSD subgroups as there is between the average LSD and delirium tremens responses.

Thus, what we have shown is not the comparison of two experiences as such, one with the other, but, rather, a comparison of two clusters of experiences. On the graphs are illustrated some average trends among the highly individualized and varied responses that were exhibited by a particular sample of persons in a particular setting.

Summary

Seventy lysergic acid diethylamide (LSD) subjects and twenty delirium tremens subjects described their respective experiences by sorting into six piles 300 statements pertaining to some aspect of these two experiences. The average experiences from these subjects were discussed in terms both of their similarities and of their differences. The delirium tremens experience was predominantly characterized by hallucinations that seemed real, anxiety, horror, depression, irritation, and paranoid thoughts. The LSD experience, in contrast, was typified by euphoria, humor, relaxation, and a nebulous sense of wonderment.

Both groups reported perceptual distortions, visual images, the sensation of increased mental alertness, somatic discomforts, distorted affect, and the sensation of having an increased rate of thought.

A method is exemplified that provides a means by which one can make comparisons using different drugs and dosages on different populations in varied psychological and physical environments.

Alcoholism Research Clinic, University of California at Los Angeles Medical Center (24).

BIBLIOGRAPHY

Abramson, H. A., and others: Lysergic Acid Diethylamide (LSD-25): Physiological and Perceptual Responses, J. Psychol. 39:3-60, 1955.

LSD-25: An Adjunct to Brief Psychotherapy, with Specific Reference to Ego Enhancement, ibid, 41:199-299, 1956.

Arnold, O. H., and Hoff, H.: Untersuchugen über die Wirkungsweise von Lysergsaure-diäthylamid, Wien. Ztschr. Nervenh. 6:129, 1953.

Bercel, N. A., and others: Psychoses Induced by LSD-25 in Normals, A. M. A. Arch. Neurol. & Psychiat. 75:588-618, 1956.

Blinn, K. A.: Personal communication to the authors.

Cholden, L., Editor: LSD and Mescaline in Experimental Psychiatry, New York, Grune & Stratton, Inc., 1956.

Cohen, S.: Personal communication to the authors.

De Ropp, R.: Drugs and the Mind, New York, St. Martin's Press, Inc., 1947.

Fichman, L. L.: Psychological Effects of LSD as Reflected in Psychological Test Changes, Ph.D. Dissertation, University of California at Los Angeles, 1957.

Huxley, A. L.: Doors of Perception [Effect of Mescaline], New York, Harper and Brothers, 1954.

Heaven and Hell, London, Chatto & Windus, Ltd., 1956.

James, W.: Varieties of Religious Experience, New York, Random House, Inc., Modern Library, 1929.

MacAndrew, C.: Personal communication to the authors.

Nowlis, V., and Nowlis, H.: Description and Analysis of Mood, Ann. New York Acad. Sc. 65:345-356, 1956.

Noyes, A. P.: Modern Clinical Psychiatry, Philadelphia, W. B. Saunders Company, 1953.

Psychodynamic and Therapeutic Aspects of Mescaline and Lysergic Acid Diethylamide: Round Table, J. Nerv. & Ment. Dis. 125:423-450, 1957.

Russell, B.: Mysticism and Logic, London, George Allen & Unwin, Ltd., 1949.

Sandison, R., and Whitelaw, J.: Further Studies in the Therapeutic Value of Lysergic Acid Diethylamide in Mental Illness, J. Ment. Sc. 103: 332-343, 1957.

Savage, C., and Cholden, L.: Schizophrenia and the Model Psychosis, J. Clin. & Exper. Psychopath. 17:405-412, 1956.

Slater, P., and others: Effect of Group Administration Upon Symptom Formation Under LSD, J. Nerv. & Ment. Dis. 124:315, 1957.

Solomon, H.: Item Analysis and Classification Techniques, Proceedings Third Berkeley Symposium, 5:177-183, 1956.

Stephenson, W.: The Study of Behavior. Q-Technique and Its Methodology, Chicago, University of Chicago Press, 1953.

Thompson, G., and Nielsen, J. M.: Engrammes of Psychiatry, Springfield, Ill., Charles C Thomas, Publisher, 1947.

———Alcoholism, Springfield, Ill., Charles C Thomas, Publisher, 1956.

Ward, R. H.: Drug Taker's Notes, London, Victor Gollancz, Ltd., 1957.

Wikler, A.: The Uses of Drugs in Psychiatric Research, Am. J. Psychiat. 112:961-969, 1956.