STABILITY OF EARLIEST MEMORIES UNDER LSD-25 AND PLACEBO

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Recent studies have clarified the relationship between the content and style of earliest memories and aspects of personality by demonstrating correlations with clinical diagnosis (6), clinical psychiatric assessment (7), character structure (5), and, predictively, with a variety of specific personality features (4). These studies lend weight to a conceptualization of the earliest memory as a precipitate of important genetic experiences and current focal concerns which reflect both nuclear conflicts and the person's attempt to deal with them.

Scrutiny of other aspects of earliest memories is rare, however. For example, the *stability* of such memories has received little attention despite its clinical and theoretical importance. Little has been done to explore the conditions under which these recollections are altered, fragmented, revised, or replaced entirely by new memories, and the study of the personalities of persons prone to such changes has also been neglected. The present report is an attempt to illuminate these areas by describing first, an investigation of the effects of the altered state of consciousness produced by lysergic acid diethylamide (LSD-25), as compared to a placebo, on the recall of earliest memories, and second, the relationship between altered and stable recall under these conditions and both the subject's drug reaction and his personality.

The stability of earliest memories over time has been investigated experimentally just once, to my knowledge. In a very brief and limited report, Winthrop (18) described two inquiries into students' earliest memories eight weeks apart. He found that only three of his 69 subjects reported entirely different earliest memories on second inquiry. Twenty-two subjects (32 per cent), however, showed some variability in the two recalls.

Psychoanalysts have been interested in screen memories and the conditions under which they are modified. Screen memories are a particular type of earliest recollection, and may be defined as repetitive early memories which a person carries with him. Often relatively innocuous life experiences, they may also be traumatic. These memories serve to conceal repressed pathogenic experiences which are usually central to the person's neurosis. The circumstances in which these screens are broken down and the concealed memories beneath them emerge in the course of psychoanalytic treatment have been investigated by some analysts. Greenacre and Saul discuss the fate of earliest memories during analysis. Greenacre (2) comments on the resistance of certain screen memories to change and the extensive analytic work necessary before they yield the repressed content beneath them. Saul (16) relates changes in earliest recollections to major shifts in the balance of psychic forces.

Kris (3) has presented the most thorough discussion of the recovery of childhood memories from a psychoanalytic viewpoint. He describes the "partial and controlled regression" fostered by the psycho-

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analytic situation as a factor that blurs the borders between past and present and encourages transitions from reporting to remembering. Correct interpretation and analysis of the influence of instinctual forces and unconscious fantasies on current conflicts are also essential factors in enabling previously repressed fantasies to become conscious. "Interpretation, then, did not produce recall, but rather it established dynamic conditions under which recall became possible, conditions more similar to those which existed when the recalled scenes and events occurred," he writes (3, p. 64). Defenses of all types (repression, isolation, denial) are erected through the years against the recollection of important "nodal" memories. The role of the ego is crucial in the emergence of these repressed memories both in its capacities to regress and to be strengthened in the course of psychoanalysis so that it may relinquish defenses and permit recall of previously repressed memories.

In a recent paper Niederland (13) focused on the role of the ego state in the recovery of early memories during analysis, noting that shifts in ego functioning on a perceptual and sensory level may re-establish a state akin to functioning at the time of an earlier crucial experience. This results "in a controllable regression to the archaic state of the ego with alteration of perception, loss of ego boundaries, transient hallucinatory phenomena" p. 568. As a result of these changes, primitive, previously repressed recollections may emerge.

The work of Kris (3) and Niederland (13) focuses, then, on the development of an archaic ego state as one means of enabling previously repressed memories to emerge into consciousness. Studies by my colleagues and me (12, 14) and others (9) indicate that an archaic ego state can be produced by LSD-25 in certain persons. While anecdotal instances of the appearance under LSD-25 of what seem to have been previously repressed memories have been reported, virtually no systematic or controlled studies have been made. In what is perhaps the only such study, my colleagues and I (12, 14) have reported an investigation of the relationship between the manner in which a subject recalled his LSD-25 experience the day after he took the drug and both his predrug personality and total drug reaction. In this study, modifications in the earliest recollection under the drug were also related to these variables. Since these results relate to those to be presented here and are drawn from the same experiments, I will review them in the discussion section of this paper where they can be integrated with the present findings.

METHOD

The data were obtained as part of an extensive study of the effects of LSD-25 on a variety of cognitive and other functions (see 9 and 12 for details). Subjects were unemployed male actors, paid volunteers, ages 20–42. They were screened for psychotic illness with a battery of psychological tests and a clinical interview. Of the 50 subjects accepted, 12 were ultimately considered to be borderline; the remaining subjects were on the normal-neurotic continuum. Experimental testing was done on two consecutive days: the "pretest day" and the "experimental day." On the latter, with a double-blind procedure, the subject, with the understanding that the experiment was designed to study the effect of a drug on his personality and behavior, received orally either 100 mg of LSD-25 or a tap water placebo.

The earliest memory (4) was elicited from all subjects on the pretest day. On the day following, under experimental conditions, the earliest memory was elicited again, with specific instructions to disregard the recall of the previous day and to reply directly to the present inquiry. On both days the same query was made: "I want you to go back into your childhood,

as far back as you possibly can, and tell me your very first memory—the earliest thing you can remember in your life." Time limitations did not permit specific inquiry into differences in the two recalls where they appeared; spontaneous comments were available in most instances, however.

Pretest and experimental earliest memories were obtained from 28 drug and 20 placebo subjects. All earliest memories were coded and the memories from each subject were paired. The sequence of report and the condition of drug or placebo were randomized. The memories were scored separately by two experimenters on a blind basis using the method of Langs *et al.* (4); differences were resolved by discussion. The scoring covers a broad range of categories derived empirically in pilot studies and falling into two major divisions. The first refers to directly mentioned items including persons present, the setting, indications of movement, and references to affect. The second division includes scores which depend to some degree on clinical judgment. Included are manifest themes such as direct body references, *i.e.*, uses of the body and themes indirectly related to body areas, such general themes as conflict, separation, dependency, moral concerns and illness, and references to damage and destruction. Also scored are an assessment of the extent of the patient's interaction with others, the logic of the memory, and the likelihood of the memory's being a real event. The roles of all persons present are assessed in detail, as is the perception of the environment reflected in the memory.[2]

The ancillary data for this study consist of, first, personality assessment and clinical diagnostic statements made for each subject (12, 14). The personality assessment was based on the Rorschach test, Thematic Apperception Test, Wechsler-Bellevue Test, a two-hour recorded clinical interview, and an autobiography. One or two experimenters rated each subject, without knowledge of experimental results, on each of 140 personality dimensions. On the basis of intercorrelations, these were later reduced to 93 items. They are grouped in terms of motives, defenses, interpersonal behavior, thought processes, inner states, and identity.

The clinical diagnostic statement was made by a single investigator who utilized the Rorschach test protocols exclusively (12, 14). The statement covered characterological diagnosis, integration of personality, problems with aggression, affective difficulties, defenses, and other notable personality features.[3]

The second set of ancillary data was drawn from the LSD-25 questionnaire and behavioral observations. The questionnaire is composed of 73 items related to affects, thought, body image, somatic symptoms, and relationship to the environment (9, 11). Starting one-half hour after drug ingestion, the questionnaire was administered at approximately two-hour intervals. Scores were developed for the overall drug reaction and 13 subscales of effects. The behavioral observations were made after each test administration, and composite scores for the entire drug day were developed. These scores were grouped into 13 subscales related to affects, suspiciousness, thought disturbances, and other dimensions of observable reactions (8).

Using both the questionnaire responses and behavioral observations to characterize each subject's LSD-25 reaction, seven clusters of drug-reaction types were developed (8). The subjects in each cluster were then compared with each other in their ratings on both the personality as-

[2] Scoring reliability ranged from approximately 50 to 100 per cent, varying with the extent to which factors of subjective judgment were involved (6).

[3] As reported elsewhere (8, 11, 12, 14), the reliability and validity of these assessment measures have been established through correlations with other personality tests, by intercorrelations among the tests themselves, and by the manner in which these measures have made "clinical sense" in their relationship to other data.

sessment and the clinical diagnostic statement. Differences significant at or beyond the 0.1 value (two-tailed) were used to characterize the personality attributes which distinguished the subjects in each cluster from all other subjects. Later, placebo subjects were identified and grouped according to the same clusters.

RESULTS

PRETEST VS. EXPERIMENTAL EARLIEST-MEMORY RECALL

Gross findings: The presentation of this research is divided into three parts. In the first part, an attempt is made to define the effects of LSD-25 on earliest-memory recall. The hypothesis proposed is that the drug will have a regressive effect on the report of these recollections, one that is distinguishable from that seen under a placebo. Once this hypothesis is tested and explored, two supplementary hypotheses will be scrutinized: 1) that regressive memory changes under LSD-25 will occur only in certain subjects and will be related to personality attributes; 2) that the changes in earliest-memory recall will be related to a strong drug effect.

Exploration of the alterations in the earliest recollection was directed, then, toward the study of anticipated regressive effects of LSD-25 on first-memory recall and also toward a scanning of the earliest-memory scoring for other unpredicted trends. Regressive trends were defined by three criteria: 1) more primitive content (*e.g.*, uncontrolled fires, part objects, prenatal experiences); 2) disturbances in style and manner of report (*i.e.*, fragmented, perservative); and 3) shifts to earlier recollections under experimental conditions. Any subject who met one or more of these criteria was considered to show a regressive effect.

Before considering regressive alterations it should be noted that, when the drug and placebo groups are compared as a whole, without consideration of the nature of the subject's drug reaction or type of earliest-memory alteration, there is little difference in the number of subjects who reported new earliest memories under experimental conditions. About half of all subjects had stable, single earliest memories, regardless of whether they received LSD-25 or the placebo; the remaining subjects showed some alteration in their second recall of their earliest memory (Table 1). Nine drug (32 per cent) and eight placebo (40 per cent) subjects reported essentially new recollections under the experimental conditions (Table 2). Drug subjects, as a group, tended to show less variability than placebo subjects in the two recalls, but this tendency does not reach statistical significance (Table 1; Items A1–A3 and B1–B4).

In regard to regressive aspects, however, group differences do emerge. In the experimental recollections, there is a greater tendency for drug subjects to show more regressive content ($p < .06$; one-tailed test), more disorganized recollections ($p < .06$; one-tailed test), and more regressive features of all types (Table 1: Items A4–A8). In keeping with these trends, memories reported under LSD-25 included fewer persons than those reported under the placebo (memories without persons: drug = four, placebo = zero, $p < .11$; memories without active participants: drug = six, placebo = zero, $p < .05$), and in the drug group memories of persons tended to be more vaguely and ambiguously described (memories without clear-cut persons: drug = eight, placebo = zero, $p < .01$).

These findings are clarified if we consider them in conjunction with the strength of the subject's reaction to the drug or placebo. The drug and placebo reactions were measured by a questionnaire on subjective reactions (9, 10). On the basis of the total experimental day questionnaire scores (a cumulative measure of the sub-

TABLE 1

Pretest vs. Experimental First-Memory Recall

Item	Drug Group (N = 28)		Placebo Group (N = 20)	
	N	%	N	%
A. Gross changes				
1. Entirely new first memory.	6	20	6	30
2. New first memory; former memory mentioned.	6	20	6	30
3. Same first memory.	16	60	8	40
4. Age shift:				
Second memory earlier.	5	18	2	10
Second memory later.	3	11	1	5
Total No. of age shifts.	8	29	3	15
5. Specifies new memory never recalled before.	3	11	--	--
6. Rambling, disconnected experimental memory.	5	19	--	--
7. Regressive content.	5	18	--	--
8. All regressive features.	7	25	2	10
	Group Totals: N	Average per Subject	Group Totals: N	Average per Subject
B. Specific overall scoring changes				
1. Added thematic and other content.	124	4.4	128	6.5
2. Dropped thematic and other content.	112	4.0	103	5.2
3. Total changed content.	236	8.4	231	11.7
4. Total stable content.	364	13.0	254	12.7

ject's response), it was found that the LSD-25 subjects who reported an essentially new earliest recollection on the experimental day were primarily those who had a strong drug reaction (Tables 2 and 3). A weak LSD-25 reaction was associated with a lack of change in the earliest memory. The difference in memory change between these two drug groups is significant ($p < .01$; Table 2). In contrast, among placebo subjects, new memories were equally divided among high and low placebo reactors (Table 2), indicating that memory change was unrelated to placebo response.[4]

When the whole placebo group, which included eight memory-change subjects (40 per cent), is compared with the 15 strong drug reactors, of whom eight also showed memory change (54 per cent), there is no significant difference between the two groups in regard to the appearance of new earliest memories. In contrast, when the placebo group is compared to the 13 weak drug reactors, of whom only one reported a new memory (eight per cent), we find that low drug reactors have significantly less memory change than placebo subjects ($p < .05$; two-tailed test). Thus, subjects who react minimally to LSD-25 do not show the apparently usual range of variability in earliest-memory recall.

The finding that strong drug reactors did not have more new recollections under LSD-25 than placebo subjects does, not, however, take into account qualitative factors such as regressive features. Investigation of the nine new earliest memories reported under LSD-25 revealed that seven (78 per cent) had regressive aspects: two were from an earlier age, two showed markedly regressive content and/or style, and three showed both these characteristics (Table 3). Only two of the eight new earliest memories from placebo subjects were from an earlier age and none had notable regressive features ($p < .05$; one-tailed test). Further, of the eight new recollections under LSD-25 reported by strong drug reactors, seven had regressive features (88 per cent); while, as noted, only two of the eight new recollec-

[4] Since memory change is unrelated to total questionnaire response in placebo subjects, these subjects will be treated as a single group in the analyses which follow.

TABLE 2

Earliest-Memory Change and Total Questionnaire Score

Total Questionnaire Score	Drug Reactors:		Mean Questionnaire Score	Placebo Reactors:		Mean Questionnaire Score
	Strong	Weak		Strong	Weak	
New earliest memory.	8	1	46.06	4	4	10.63
Same earliest memory as pretest.	7	12	34.84	6	6	11.50
	Chi-square = 4.80 $p < .05$		$t = 2.70$ $p < .01$	Chi-square = 0 $p = ns$		$t = 0.26$ $p = ns$

TABLE 3

*Earliest-Memory Change in Strong and Weak Drug Reactors and Placebo Subjects**

	Drug Subjects				Placebo Subjects	
	Strong Drug Reactors		Weak Drug Reactors			
	N	%	*N*	%	*N*	%
New memory, regressive in age or content.	7	47	0	0	2	10
New memory, not regressive.	1	7	1	8	6	30
Same memory as pretest.	7	47	12	92	12	60

* Chi-square (four degrees of freedom) = 15.61; $p < .01$.

tions from placebo subjects showed such features ($p < .02$; two-tailed test).

We may now summarize these initial findings. While comparison of drug and placebo subjects for the appearance of any type of new recollection under experimental conditions reveals a comparable number of new memories in both groups, significantly more drug subjects showed a shift to new memories with regressive features, a change which was essentially absent in the recollections of placebo subjects. When altered recall is considered in conjunction with the drug or placebo response, strong drug reactors show more regressive changes in their second memory report than placebo subjects. Further, weak drug reactors show significantly less memory change than do placebo subjects. These findings indicate that LSD-25 had a distinctive effect on the recall of earliest memories.

The following pairs of memories exemplify the regressive effects seen under LSD-25:

SUBJECT 1

Pretest: I remember one afternoon when we were walking along—a friend of mine and myself—we were walking and I was holding out my hand to say something to him and a bird flew over and there it was, right in the palm of my hand: a bird turd.

Under LSD-25: Of a bird—also of the chow dog that we had—the fire in the vacant lot—and the sled—the memory is in the area of P.—street—the place I'm seeing—trying to picture myself in—my home in X. I was a bed wetter also—sled—it's hard to single out one—getting three or four that just revolve around changing focus—like you flip in slide projector. The sled—can't picture it as the first primal experience—if you will—just trying to think in this area—a wheel of fortune coming to stop and clicks over—clicks over—clicks over—and not being able to pick out one of the group I gave you.

SUBJECT 2

Pretest: Yeah, I think my mother is about the first thing I remember. And I must have been two or three. I just remember her face. Her face as I saw it then. And I can still see that.

Under LSD-25: My mother's mouth—and her smile—I'm almost sure it's the first thing I saw—remember the smile as if I were a child seeing just her smile—and her bending over, and I remember a pair of young, glistening bright eyes that went with the smile.

Inquiry about the two memories from

TABLE 4
Specific Changes in First-Memory Recall

First-Memory Item	Changes in Recall				p Values (Total Change)
	Drug Group		Placebo Group		
	Added	Dropped	Added	Dropped	
Major shifts in persons in the memory.	3	2	0	0	$<.10$
Themes of separation.	0	2	4	4	$<.02$
Indications of conflict.	3	0	4	4	$<.05$
References to damage.	2	1	6	3	$<.05$
Role: someone harms.	2	1	4	7	$<.01$
Role: someone is harmed or is a pawn of others.	2	2	8	5	$<.05$
Direct references to the body.	2	4	7	0	$(<.10)$*

* p value is for theme added only.

Subject 2 indicated that the drug memory is an *earlier* recollection. The drawings of these memories show the pretest recollection to be of the mother's face in full, while the LSD-25 memory is of her mouth in isolation.

Specific findings: The two earliest memories reported by each subject were scored separately for thematic content, roles and other aspects. The two sets of scores were then compared so that items which were added or dropped in the experimental recall could be ascertained. The placebo group showed significantly more variability than the drug group in regard to a series of specific scoring items including traumatic themes and roles, and references to the body (Table 4). Only in regard to the persons populating the memories did the drug group show greater variation than the placebo group. These results are in keeping with the gross finding that, in addition to regressive effects, LSD-25 had a constricting effect on the usual variations in earliest memory recall.

The results are complicated, however, by the fact that placebo subjects tended initially, in their pretest memories, to have more earliest memories with traumatic and conflictual content than did drug subjects. In the personality ratings too, placebo subjects were assessed as being more aggressively conflicted than LSD-25 subjects. (Most of these group personality and memory content differences reach only the 0.1–0.2 levels of significance, however.) Since most of the specific scoring items added or dropped significantly more often by placebo subjects than by drug subjects relate to aggressive and traumatic content, aspects of the earliest-memory alterations may in part be the artifactual result of this initial difference. To investigate this possibility and to further examine differences in drug and placebo effects, several additional analyses were performed.

The first analysis compared the 12 drug and 14 placebo subjects who were assessed from their Rorschach test protocols as having major conflicts with aggressive impulses. Under LSD-25, aggression-conflicted subjects tended to report fewer new earliest memories than the remaining drug subjects (only two of the nine new recollections were from these 12 subjects); they also showed little specific content variation in their two recalls. In contrast, half of the aggression-conflicted placebo subjects reported new earliest memories under experimental conditions; seven of the eight new recollections from the placebo group were from these subjects. As a result, there was considerable variability in the scoring of the two earliest memories from these placebo subjects, particularly in regard to adding new con-

tent and themes in the second recall. The specific areas in which the paired recollections from these placebo subjects showed more variability than those from this group of drug subjects included themes of damage, conflict, harm, and bodily references, and roles in which persons are the recipient of aid and care.

As a further check of artifactual factors, all subjects were grouped according to their primary characterological diagnosis, using the method of Schafer (17; see 5 and 14 for a detailed description). Five diagnostic categories were used: obsessive-compulsive, inhibited obsessive-compulsive, hysteric, narcissistic, and schizoid. Drug and placebo subjects with the same basic character structure were compared for the extent of change in their two earliest recollections. Because of the small number of subjects in each characterological grouping, the findings will be briefly summarized.

All of the diagnostically paired groups showed differences in the effects of LSD-25 and the placebo on the experimental recollections. In general, the trends in these comparisons were for drug subjects to show less content change and more regressive features than their placebo subject counterparts. Comparatively greater alterations in the recollections of drug subjects, when they did appear here, revolved around voyeuristic, oral, and anal themes, and heightened movement and interaction. Greater content changes in placebo subjects related primarily to traumatic themes and roles. One characterological grouping of drug subjects, those who were considered to be schizoid (persons who are introspective, withdrawn, and have poor object attachments), showed noticeably more alterations in their experimental recollections than placebo subjects with the same character structure.

In summary, analyses of earliest-memory alterations for drug and placebo subjects, matched for conflicts with agressive impulses and for characterological diagnosis, suggest that LSD-25 and placebo did, indeed, differ in their effects on the recall of earliest memories. While placebo subjects showed a trend toward more pronounced conflicts with aggression in their usual personalities and toward reporting and altering more traumatic content in their recollections than did drug subjects, these matched analyses and the differential gross effects reported above indicate that the initial differences between the groups do not account for the difference in drug and placebo effects on the earliest memory. We will now turn to a more detailed study of the relationship between personality make-up and earliest-memory change in quest of further results to support the hypothesis that the basic findings in regard to the specific effects of LSD-25 on the earliest memory did not appear because of artifactual factors.

PERSONALITY FEATURES RELATED TO EARLIEST-MEMORY CHANGE AND STABILITY

In order to explore more fully the personality attributes of subjects who reported stable and altered earliest memories under the drug and placebo, the results of the several personality assessment measures were studied. The clearest picture of these two groups of subjects emerged from the person-cluster analysis which also provided, in the case of the drug subjects, information regarding the subject's response to LSD-25. In this analysis, subjects with similarly patterned subjective and behavioral reactions to LSD-25 were grouped together, forming seven clusters. The subjects in each cluster were then compared with respect to personality features, using the clinical appraisal of the Rorschach test and the 93-item personality assessment, thereby establishing the personality attributes which distinguished the subjects in each cluster.

In placing high and low memory-change drug subjects into these seven clusters,

it was found that eight of the nine high memory-change subjects fell into two clusters (Table 5: Nos. II and V). Actually, all of the subjects in these two clusters altered their earliest memory under LSD-25. The remaining high memory-change subject fell into Cluster I, which also had three low memory-change subjects, and the other low memory-change subjects fell into the remaining clusters. The distribution of the subjects in these seven clusters is significantly different from chance expectations, indicating that we are dealing with a meaningful relationship between extent of memory change and both types of drug reaction and personality.

High memory-change clusters: Subjects in Cluster II were distinguished from the other subjects in the personality assessment as being schizoid[5] and narcissistic (impulsive, superficial, self-centered) and having a poorly integrated character structure. Further, they are characterized as being low in self-esteem, depressed and self-abasing, having diffused and conflicted identities, and tending to be homosexual, passive and dependent. The evaluation indicated that they are often anxious and tend to somatize and regress under stress. They are obsessive, inhibited, and prone to primary process intrusions in their thinking. They show paranoid trends and have much aggression pent up in fantasy, which they are unable to verbalize. They feel incompetent, have poor defenses, and attempt to compensate by avoiding self-awareness.

The subjects in this cluster showed a strong LSD-25 effect on both the questionnaire and behavioral observations. Loss of controls, thought disturbances, visual distortions, feelings of altered meanings, loss of contact, suspiciousness, and changes in the self were all prominent in their drug reaction; anxiety and somatic symptoms were relatively uncommon.

[5] All cluster findings reported here are significant at the 0.1 level or better.

TABLE 5

Drug Reaction Types and Memory Change

Reaction Type	Drug Group*		Placebo Group†	
	High Memory Change	Low Memory Change	High Memory Change	Low Memory Change
I	1	3	2	0
II	4	0	0	2
III	0	1	1	0
IV	0	2	2	3
V	4	0	2	0
VI	0	7	0	1
VII	0	2	1	0
Subjects not classified into a cluster	0	4	2	4

* Drug group: chi-square (seven degrees of freedom) = 24.54; $p < .001$, two-tailed.

† Placebo group: chi-square not significant.

Subjects in the other high memory-change cluster (No. V) were also characterized as schizoid and as having poorly integrated character structure. Further, they are narrow in their interests, not intellectual, and not introspective, sensitive, or creative. They are notably lacking in hostility, depressive features and anxiety. They are chameleonlike, fitting into any setting, and are hypomanic, often playing the clown. They also scored high on the Minnesota Multiphasic Personality Inventory scale for bodily concern.

These subjects, under LSD-25, reported effects which were concentrated in their bodies in the form of both somatic symptoms and body-image changes. They also reported feelings of slowed movement and thought. They showed few behavioral changes.

Clusters II and V are the two main groups into which subjects with schizoid features and poor personality integration fell. Cluster II subjects show their disturbances openly, while Cluster V subjects create a facade and conceal their difficulties beneath it.

Low memory-change clusters: Cluster I

subjects include persons who are impulsive, changeable, sensitive, intellectual, and able to relate well. These subjects showed minor schizoid trends (this includes the one high memory-change subject who fell into this cluster). Their drug reaction was extensive and included expansive and elated aspects, thought disturbances and body-image changes. Cluster III subjects are passively aggressive and depressed, controlling their feelings with rigid defenses. Under LSD-25 they resisted response until the peak of the drug's effect, when they showed for only a brief period severe regressive effects in most areas, particularly body-image changes, anxiety about losing control, and suspiciousness. Cluster IV subjects are withdrawn, defensive, hostile, paranoid persons who experienced under LSD-25 considerable anxiety and loss of control, helplessness and anger. Cluster VI subjects were assessed as inhibited obsessive characters, who are independent, high in self-esteem, heterosexual, and somewhat defensive, guarded and manipulative; they strive persistently for goals and are particularly lacking in schizoid and narcissistic features. Their LSD-25 reaction was characterized by its minimal degree of effect in virtually every area of subjective and behavioral response. Last, Cluster VII subjects are labile, impulsive and hypomanic, with hysterical character traits. They had a minimal subjective response to the drug, but were notably elated, silly and hyperactive in their overt behavior.

According to the features of their personality assessments, placebo subjects were placed into the seven LSD-25 person clusters (Table 5). There was no significant trend for high or low memory-change subjects to fall into a given cluster.

To summarize: Major changes in the earliest memory under LSD-25 occurred in subjects with considerable psychopathology. They fell into two subgroups: one group showing their disturbances openly, the other concealing them behind a social facade.

Subjects who maintained stable earliest-memory recall under LSD-25 did not have schizoid features and fell into several groups. Some were impulsive and labile; others were rigid, withdrawn, hostile and suspicious. The largest group (and this may be in part a sampling bias) consisted of persons with inhibited obsessive characters who are independent, heterosexual, prone to strive for goals, but guarded and defensive.

Placebo subjects, on the other hand, did not show any relationship between personality make-up and altered or stable, earliest-memory recall.

The differences in personality correlates of stable and altered recall in the drug and placebo groups lend further support to the hypothesis that LSD-25 had a distinctive and specific effect on earliest-memory recall.

EARLIEST-MEMORY CHANGE AND QUESTIONNAIRE RESPONSES

It was anticipated that alterations in, and the stability of, earliest-memory recall would be related to the LSD-25 reaction and unrelated to placebo response. The results reported in the two previous sections (Tables 2 and 3) suggest that this is true. As already noted, comparison of the two memory-change groups indicated that the nine high memory-change LSD-25 subjects experienced a more extensive reaction to the drug than 18 LSD-25 subjects whose earliest recollection were stable. The pretest (nondrug) questionnaire scores also differentiated these two groups: high memory-change subjects had higher pretest scores than low memory-change subjects (mean number of responses: 7.8 *vs.* 3.8; $p < .02$). On the drug day, the average drug effect at one-half, two, five and nine hours after LSD-25 ingestion was consistently greater for the high

memory-change subjects (at two hours, when the first memory was elicited: mean scores: 28.6 *vs.* 19.6; $p < .05$).

This trend for greater questionnaire scores in high memory-change subjects was consistent for all 17 subscales of related drug effects (9). The greatest areas of difference between the two memory-recall groups were seen in subscales referring to feeling of alienation from one's self (mean = 3.4 *vs.* 1.7; $p < .01$), body-image changes (mean = 5.0 *vs.* 2.8; $p < .01$), and somatic symptoms (mean = 8.2 *vs.* 6.3; $p < .02$). Other trends included more pervasive feelings of both inhibition (mean = 4.3 *vs.* 3.1; $p < .10$) and disinhibition (mean = 5.1 *vs.* 3.3; $p < .10$) and more feelings of new meanings in experiences (mean = 1.8 *vs.* 1.1; $p < .10$) reported by high memory-change subjects.

The placebo group was similarly divided into eight high memory-change and 12 low memory-change subjects. The questionnaire responses were explored to determine the extent of the placebo reaction in each group (10). There were no significant differences between the two placebo memory-change groups on the pretest or experimental questionnaires (Table 2). The subscale scores differentiated the two groups on only two scales to a degree approaching significance: low memory-change subjects showed more suspiciousness (mean = 1.0 *vs.* 0.5; $p < .10$, two-tailed test) and negative, unpleasant affect (mean = 1.0 *vs.* 0.4; $p < .06$, two-tailed test).

Thus, high and low memory change is related to drug effect but unrelated to placebo response. Altered recall is associated with a strong subjective response to LSD-25 in every area, particularly changes in the self and body images.

These results again support the hypothesis of a specific LSD-25 effect on earliest-memory recall.

DISCUSSION

Before discussing the present findings, we must be reminded of the limitations of this study. The sample of unemployed actors is not a representative one and may have fostered biased observations. By relating the findings to specific personality attributes, some attempt was made to modify the influence of this factor. The lack of sufficient time for a full inquiry into the fate of unreported recollections under experimental conditions also leaves a number of questions unanswered. Lastly, the small number of subjects in many of the experimental groupings restricted the extent to which clearly significant results were available. We can, therefore, accept the present findings as only tentative; validation is essential.

PRESENT RESULTS

The present results indicate that LSD-25 has specific effects on earliest-memory recall which differ from those of a placebo. The type of earliest-memory change, the personality correlates of altered recall, and the type of drug reaction seen in subjects with altered recall were all distinctive and different from the effects and correlates seen with the placebo. Thus, while about 40 per cent of all subjects reported some type of new earliest memory under experimental conditions, the nature of the memory change and its correlates differed under the two conditions. Under LSD-25, there were regressive shifts whose appearance correlated with both drug reaction and personality. In contrast, under the placebo, the reports of new memories were apparently random, nonregressive, and unrelated to placebo response and personality. The archaic ego state induced in certain subjects under LSD-25 was apparently the crucial factor in producing regressive earliest-memory shifts.

Subjects who altered their earliest memory under LSD-25 showed a generally

marked reaction to the drug, particularly in regard to changes in the self and body image. They were schizoid, narcissistic characters, with poor personality integration and considerable psychopathology. Such persons seem particularly susceptible to the altered levels of consciousness and archaic ego state produced by LSD-25. One result of these alterations was difficulty in focusing attention, which led to fragmentation of their earliest recollections (see Subject 1). Furthermore, there seemed to be a shift in the primary modes of experiencing for these persons, which fostered recollection of experiences not usually in awareness (see 13; also Subjects 1 and 2). Last, we may hypothesize a lifting of repressive barriers and a regressive momentum as a result of the drug, leading to an imbalance of psychic forces and structures and to the emergence of usually repressed recollections in these subjects.

All of these appear to be factors in altered recall. Schizoid persons with poorly established boundaries between the elements of their personality appear to be particularly susceptible to such effects, and their usual earliest memory is likely to give way to an earlier, more primitive recollection under LSD-25.

Subjects who showed stable or constricted earliest-memory recall under LSD-25 fell into several groups. Some were impulsive and labile with either expansive or minimal drug reactions. Others were rigid, withdrawn, hostile and suspicious with either a constricted LSD-25 experience or one with considerable anxiety and feelings of helplessness. The largest group was composed of inhibited obsessive characters who were independent, heterosexual, prone to strive for goals, but guarded and defensive. Their drug reaction was minimal in every area. While a sampling bias may be a factor in their being the largest group, they, nonetheless, serve as a strong contrast to the two groups of high memory-change subjects. These guarded, constricted subjects seemed to tighten their defenses under LSD-25 and show a constricted, terse recall of their previously reported earliest recollection. Earlier, more primitive memories were not fostered nor permitted access to awareness; regression was not permitted on any level.

This relationship between predrug personality, drug effect and memory style has already been reported (12, 14) in a study of the recollection of the LSD-25 experience on the day following drug ingestion. Three styles of recalling the drug experience (adding to, subtracting from and recalling accurately) were related to an immediate memory task and to stable and unstable earliest-memory recall. In that report, subjects who added to and elaborated upon their drug experience had a strong, broad drug effect and showed a striking capacity afterwards to remain in touch with their experience in the altered state. These subjects were schizoid with poorly integrated personalities, and they reported new earliest memories under the drug. In contrast, stable earliest-memory recollections were found in two groups. The first was the "accurate recallers": inhibited obsessive-compulsive characters with rigid, effective defenses, who showed a minimal drug reaction which they later recalled precisely and whose earliest memories were static and inhibited. The second was the "subtractors": paranoid, hostile, well integrated, obsessive-compulsive persons who failed to recall much of their LSD-25 reaction, which itself was largely experienced as in the environment, external to themselves. These subjects also deleted much of their initial earliest memory under LSD-25. The results of this earlier study, therefore, parallel and support those reported here.

In the placebo part of this study, it was found that there was no relationship between altered and stable earliest-memory recall and personality features or placebo response. Altered recall in placebo subjects

did not show regressive features, but seemed more the result of describing an alternate, readily available recollection drawn primarily from the same age level as the memory reported initially. In fact, several placebo subjects stated that they welcomed the chance to tell another earliest recollection, one they hadn't been able to mention the previous day. The experimental setting, in which the search for new recollections may have been implicit, may therefore account for the high percentage of change. Suggestibility, however, was not a prominent personality feature in these subjects. Thus, we may conclude that, in the absence of an archaic ego state, random alternate recollections are reported by some subjects in a manner which does not meaningfully relate to other measures used in this study.

FORMULATIONS FOR CONSIDERATION

The results of this research lend themselves to a conceptualization of the earliest memory in terms not previously experimentally supported. While previous reports have demonstrated a relationship between the *content* and *style* of the earliest memory and personality (4–6), the present results suggest that the *stability* of the earliest memory may also be related to personality factors. The relationship between these two earliest-memory dimensions, content and stability, remains open for further exploration. At present, however, the findings suggest a view of the earliest memory itself as a structure within the ego. The nature of this memory structure and its stability seem to vary in keeping with the overall structural cohesiveness, stability and dynamic balance of the ego. Thus, in persons with a well integrated and relatively stable ego organization, the earliest memory is a stable structure and resists shift or breakdown under regressive pressures such as those brought into play by LSD-25. In contrast, persons with a poorly integrated and relatively unstable structural balance, where primary-process intrusions have access to consciousness even in the waking state, have earliest-memory structures which are particularly vulnerable to the effects of LSD-25. As part of the regression and altered ego state caused by the drug, to which such persons are particularly susceptible, two types of alterations in the earliest memory may occur. Either the memory itself may fragment and be invaded with intrusions from the primary process; or previously repressed memories, often of an experience earlier than that originally reported in the waking state, may enter awareness and replace the initial memory. These new recollections are, therefore, usually more primitive than nondrug recollections, in keeping with the prevailing archaic ego state both at the time of the drug experience and the actual early event.

These formulations, deduced from experimental data, parallel and extend those of Niederland (13), who utilized clinical observations of two patients in psychoanalysis to clarify the manner in which the re-establishment of an archaic ego state fostered the recall of previously repressed primitive early memories. Although Niederland gave only brief clinical sketches, it seems likely that the two patients in whom the regressive experience and recall occurred would fall into the two clusters of high memory-change drugs subjects described here. This suggests that we are dealing with a general characteristic of the personality make-up of a specific group of persons. Further study can clarify the personality attributes of such persons and the nature of the regressive alterations they experience.

SUMMARY

The present findings suggest the following tentative conclusions:

LSD-25 has two major effects on earliest-memory recall not seen with a

placebo: it produces regressive trends in the recollections of some subjects and has a constricting effect on the recall of others.

Subjects who regressively alter their earliest memory under LSD-25 tend to be schizoid, with poorly integrated personalities. They experience a strong general drug effect which accents changes in the self and body image. LSD-25 constricts or does not affect the earliest memories of impulsive, rigid, guarded, and inhibited obsessive persons who mostly show a minimal reaction to the drug.

For placebo subjects, altered or stable earliest-memory recall is unrelated to personality make-up and placebo reaction. Changes in their recollections do not tend to be regressive and seem, instead, to reflect a search for readily available, alternate recollections.

Earliest memories may be viewed as structures within the ego. Their relative stability appears to be a function of the ego's general capacity to maintain overall structural stability, tested in this study by a drug which alters the level of consciousness and produces an archaic ego state.

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