

THE EFFECTS OF A DRUG-INDUCED ALTERATION IN STATE
OF CONSCIOUSNESS ON RETENTION OF DRIVE-
RELATED VERBAL MATERIAL

I. H. PAUL, Ph.D.¹

INTRODUCTION

When factors that influence the retention of verbal material are investigated, the experimental subjects typically are fully awake, alert and attentive. In this "state of consciousness" the most influential class of factors are likely to be the structural or formal properties of the stimulus material. The role of content is largely restricted to the variable of familiarity, though the attitudes and interests of Ss may appreciably enhance the influence of content. But whether the material to be retained is aggressive or sexual makes little difference (2, 9, 11), at least to an S who is functioning under optimal expectational and intentional sets and who is wide awake. Derivations from psychoanalytic theory that predict the differential learning and recall of drive-related or emotional material have—once the formal stimulus properties are well controlled, and once the attitudes and interests of Ss are taken into account—received virtually no experimental support.

The fault, however, may lie less with the theory than with the derivations. Rapaport (7, 8) and Klein (1) have criticized such derivations on the grounds that they are formulated without regard for a central assumption in psychoanalytic thought; namely, that adults have relatively autono-

mous capacities to perceive and to learn in accordance with the structure and demands of reality. Cognitive functioning can readily proceed, free from the pressures of drives, so long as the person is in a fully waking state of consciousness; relatively autonomous cognitive functioning is, according to recent developments of the theory (4, 10), dependent on level or state of consciousness. Thus it is no blow to the theory that people who are wide awake can handle material of whatever emotional charge or connotation as well as they can handle neutral material. But alter their state of consciousness—induce drowsiness, reverie, sleep, and the like—and then drives ought to assume their influence; weaken the person's capacity for autonomy, and then you will observe the impact of drive material.

Serious methodological problems confront attempts to study learning and recall under states of drowsiness or reverie. How can S be given task-appropriate instructions without interfering with the state of consciousness? The drowsy S will wake up to learning instructions; the S who is in reverie will come out of it when the experimenter requires him to attend to a stimulus with the intention of recalling it later on. The induction of an altered state of consciousness by means of drugs provides a way to circumvent these difficulties. Such a state is less fragile, and though instructions to attend to a verbal stimulus will have some effects on it, we can be confident that S will remain in a state of consciousness that is appreciably different from S who has taken a placebo. Using a drug, however, introduces unknown contaminating factors, and these factors must be carefully studied if the

¹Research Center for Mental Health, New York University, Washington Square, New York City. Dr. Robert J. Langs collaborated in the design and execution of this study; I gratefully acknowledge his very substantial contribution. My thanks also to Bernard Ehrenberg for his assistance in scoring and analyzing the data. Dr. George Klein, Dr. Robert Holt and Dr. Donald Spence provided valuable criticisms and suggestions. This research was supported by a grant from the National Institute of Mental Health (M-4244).

effects on learning and recall are to be understood.

The present study was part of a larger intensive investigation of the effects on cognition of LSD-25, a drug that induces in Ss a transient disturbance which often has earmarks of a psychotic state. One of the main conclusions to emerge from that investigation was that many effects of the drug may be conceptualized as due to an alteration in state of consciousness. From a study of Ss' protocols as well as from their responses to a periodically administered questionnaire, Linton and Langs (3) conclude: "We consider our findings relevant to the concept of altered levels of consciousness, in particular the primary process level of functioning. Comparison of the pretest and drug day protocols shows that the drug produces an accentuation of thinking by means of images, alterations of self-experience, including feelings of detached self-observation and estrangement, confusion of personal identity, the experiencing of events in terms of implied meanings, loss of boundaries between the self and the environment, drive-dominated thinking, alterations in the distribution of attention cathexis, somatization, and an increase in feelings of passivity, expressed as a subjective loss of control" (p. 366).

This ensemble of widespread effects obviously encompasses more than an alteration in state of consciousness. But it does seem to include a reduction in autonomous cognitive functioning, and therefore the present study of the differential effects of LSD on the retention of drive-related and neutral verbal material may be germane to the proposition that drives will influence cognitive functioning under conditions of an altered state of consciousness.

METHOD

Subjects were 45 male professional actors who volunteered (for pay) for a study of the psychological effects of an unspecified drug, and who were carefully screened for

evidence of serious psychological disturbance. The drug and a placebo were administered to Ss according to a double-blind design.² They were seen individually on three successive days. On the second (experimental) day, 25 Ss were given 100 gamma of LSD-25, and 20 Ss were given a placebo.

Ability to retain verbal material was assessed by the theme-list technique, a procedure that was devised during a series of experiments on memory styles (5, 6). A theme-list is a loosely connected set of passages that forms the plot outline of a story. Four theme-lists were constructed, two of them containing drive-related material (sexual and aggressive), and two containing more neutral material.³ An attempt was made to equate each drive theme-list with a neutral one as its control. Not only do the corresponding themes in each contain the same number of information units (or idea units); they also contain the same kind of sentence construction with same number of qualifiers, nouns and verbs. An attempt was also made to incorporate similar kinds of ambiguities, gaps and surprises in each. The drive theme-lists and their neutral controls are given in Table 1 and Table 2.

Subjects were tested once in the morning and once in the afternoon on both pre-experimental and experimental days. The four theme-lists were presented in a pre-established scrambled order with one major restriction: a drive theme-list and its control were always given on the same day. For example, when S had the aggressive theme-list on the morning of the pre-experimental day he had the aggressive-control theme-list that afternoon (and vice versa);

² The reader who is interested in a detailed and full description of the study will find it in Linton and Langs (3).

³ The difference between the pairs of theme-lists with respect to drive content is only a relative one. The neutral theme-lists also contain drive-related material, though in a more socialized and less blatant form.

this S
contr
equal
each
Ad
done
a me
The
read t
"I
of
like
list
knc
the
clos
hav
The
eac
—
The t
a slig
unit.
numb
Im

Ag

Title:
Theme

Theme
Theme
Theme
Theme
Theme
Theme

Title:
Theme

Theme

Theme

Theme
Theme
Theme
Theme

this S then had the sexual theme-list and its control during the experimental day. An equal number of Ss had each theme-list in each position.

Administration, as well as scoring, was done without knowledge of whether S was a member of the drug or placebo group.

The following learning instructions were read to S:

"I am going to read you a list of themes of a story called '_____.' I would like you to listen carefully as I read this list of themes because I want you to get know it. I will read you each of the themes twice in succession. Please listen closely and get to know them. Do you have any questions? All right, let's start. There are seven themes, and I will read each one twice. The story is called '_____.'"

The theme-list was read quite slowly with a slight break between each information unit. When each theme was repeated its number was also repeated.

Immediately upon finishing the presenta-

TABLE 1
Aggressive Theme-List and Neutral Control

The Aggressive Theme-List	
<i>Title:</i>	The Vampire
<i>Theme 1:</i>	The bearded / captain / was a damn big man / that hot / night /
<i>Theme 2:</i>	Men / were guzzling / burning / rot gut /
<i>Theme 3:</i>	They cut him down / with cruel / barbs /
<i>Theme 4:</i>	A vicious / stroke / lacerated / five /
<i>Theme 5:</i>	She / watched / the bloody / fight /
<i>Theme 6:</i>	A butcher / knife / plunged deep /
<i>Theme 7:</i>	There was a satisfied / peace /
The Aggressive-Control Theme-List	
<i>Title:</i>	The Monkey
<i>Theme 1:</i>	The costumed / general / was filled with pride / that Spring / morning /
<i>Theme 2:</i>	Children / were chanting / gay / nursery rhymes /
<i>Theme 3:</i>	They circled round him / with dancing / smiles /
<i>Theme 4:</i>	A glittering / coin / rolled / among feet /
<i>Theme 5:</i>	She / heard / the frenzied / scramble /
<i>Theme 6:</i>	A hairy / paw / scooped it up /
<i>Theme 7:</i>	There was noisy / crying /

TABLE 2
Sexual Theme-List and Neural Control

The Sexual Theme-List	
<i>Title:</i>	Forbidden Sin
<i>Theme 1:</i>	He watched / intently / the blonde , strip / in the dark /
<i>Theme 2:</i>	Wriggling / she showed / her belly /
<i>Theme 3:</i>	Lights / dimmed / on gleaming / skin /
<i>Theme 4:</i>	She rubbed / naked / breasts /
<i>Theme 5:</i>	He peeked / through fingers / covering his eyes /
<i>Theme 6:</i>	Down on the bed / she peeled off / black panties /
<i>Theme 7:</i>	Quotes "God, is that man / or woman!" /
The Sexual-Control Theme-List	
<i>Title:</i>	Strange Lyrics
<i>Theme 1:</i>	He listened / raptly / to the brunette / singing / on the air /
<i>Theme 2:</i>	Lisping / she told / of sorrow /
<i>Theme 3:</i>	Violins / swayed / with silken / tones /
<i>Theme 4:</i>	She crooned / of love / forgotten /
<i>Theme 5:</i>	He hummed / through clenched / smiling / lips /
<i>Theme 6:</i>	In the final stanza / she pronounced / a man's / name /
<i>Theme 7:</i>	Quotes "Heavens, is that me / or him!" /

tion, S's attention was diverted for about five minutes by giving him a Feeling Tone Checklist to determine his mood. After the interpolated task was finished, the following recall instructions were read:

"Now I would like you to tell me that list of themes. Please try to recall them as accurately as you possibly can. It's probably impossible for you to recall them word for word, but try to be as precise and as word perfect as you can in reproducing what I read to you. Any questions? Remember, be as precise as you can. Please go ahead."

A verbatim transcription of S's reproduction was taken. He was given some support and encouragement if needed, but was not given any cue or hint. When he was finished he was asked, "Anything more?" or "Do any other stray bits of the themes occur to you?"

On the morning of the experimental day,

before the new theme-list was administered, and also on the morning of the post-experimental day, *S* was asked for a recall of the day before's theme-lists. Again the instructions emphasized accuracy and completeness.

Each reproduction was scored for accuracy, for intrusions, and for distortions. Intrusions are information units that correspond to none in the stimulus. Distortions are information units whose meaning has been substantially changed. Accuracy was scored on a three-point scale: two points for a word-perfect information unit, and a score of one for a synonym and for a closely related meaning. Two examiners scored all reproductions, and discrepancies were eliminated afterwards by discussion. Three steps were taken to promote consistent scoring: 1) A running list of decisions was kept and compiled into a manual that could be consulted during the scoring; 2) Reproductions were scored by theme-list and not by *S*; 3) Each examiner re-scored the entire set of

reproductions a second time a few weeks after he had completed the first scoring.

RESULTS

Analysis of the intrusion and distortion scores yielded no significant results of any kind; neither was substantially affected by the drug, and, though there were some significant differences among the four theme-lists, neither score varied systematically with presence or absence of drive content. The accuracy score, however, did yield significant results. Table 3 presents the groups' mean accuracy scores and the standard deviations on the four theme-lists under the experimental conditions. Table 4 summarizes these findings and presents the results of separate analyses of variance on each group.

The groups were not equated to begin with; on the pre-experimental day the placebo *Ss* achieved higher accuracy scores than the drug *Ss*. But this difference falls somewhat short of statistical significance ($F = 3.35, p < .10$), while the difference between the groups' experimental day scores is highly significant ($F = 15.34, p < .001$). The results of the analyses of variance, shown in Table 4, reveal that the experimental conditions made no significant difference for the placebo *Ss*, while they made a highly significant difference for the drug *Ss*: the placebo had no effect on accuracy of reproduction, while the drug substantially lowered the accuracy scores.

Table 4 shows that the drive theme-lists were retained better than the neutral ones. This finding reaches significance at the .07 level for the placebo *Ss*, and beyond the .001 level for the drug *Ss*. Inspection of Table 3 shows, however, that this finding is wholly attributable to the superiority of the sexual theme-list; except under the impact of the drug, the aggressive theme-list was not superior to its control. A separate analysis of the placebo *Ss*' scores for both days shows that they retained the sexual theme-list significantly better than they

TABLE 3
Accuracy of Retention of the Four Theme-Lists Under the Experimental Conditions

Drug Subjects	Pre-Experimental Day			Experimental Day		
	N	Mean	S.D.	N	Mean	S.D.
Aggressive	11	24.6	9.9	14	24.5	8.6
Aggressive-Control		24.5	8.4		17.9	8.7
Sexual	14	31.4	5.1	11	24.0	7.2
Sexual-Control		26.0	6.5		15.6	5.1
Placebo Subjects						
Aggressive	10	28.6	8.4	10	29.7	8.4
Aggressive-Control		29.4	6.9		31.3	8.0
Sexual	10	34.5	6.3	10	33.7	4.2
Sexual-Control		26.5	8.0		30.4	7.7

Pre-ex
Experi

To

Condit
Theme
Subjec

Condit
Condit
Theme

Remain

* Th

retain
that t
differe
sexual
 $p < .0$
sexual
compa
list ac
the dr
follow
ference
these f
in men
The sig
4, then
superio
non-dr
relatio
tentior
Und
such a
that fo
Ss, the
tween
the for
neutral
lists. T
experin

TABLE 4
Summary of Accuracy Results (from Table 3) and Results of Analysis of Variance

	Drug Ss				Placebo Ss			
	Drive	Neutral	Total		Drive	Neutral	Total	
Pre-experimental day	28.4	25.4	26.9		31.5	27.9	29.7	
Experimental day	24.3	16.9	20.6		31.7	30.8	31.3	
Total	26.3	21.1			31.6	29.3		
Source	df	Variance	F-ratio*	p	df	Variance	F-ratio*	p
Conditions (Pre-Exp)	1	998.6	25.35	< .001	1	46.5	1.77	nsd
Theme-lists (Drive-Neutral)	1	686.4	17.43	< .001	1	99.0	3.76	.07
Subjects	24	135.7	3.45	< .001	19	165.8	6.30	< .001
Conditions × Theme-lists	1	116.6	4.84	< .05	1	37.8	1.50	nsd
Condition × Ss	24	54.3	2.25	nsd	19	25.5	1.01	nsd
Theme-lists × Ss	24	39.7	1.65	nsd	19	27.6	1.10	nsd
Remainder	24	24.1			19	25.2		

* The main sources were tested by pooling the interactions and the remainder.

retained the other three theme-lists, and that the other three were not significantly different from one another (e.g., comparing sexual and aggressive-control, $t = 2.50$, $p < .02$; comparing aggressive-control and sexual-control, $t = 1.27$, *nsd*; and the other comparisons not involving the sexual theme-list achieve t 's of less than 1). The fact that the drug Ss' pre-experimental day scores followed precisely the same pattern of differences adds support to the conclusion that these findings reflect the natural differences in memorability among the four theme-lists. The significant drive-neutral factor in Table 4, then, reflects only the sexual theme-list's superiority, and we can conclude that under non-drug conditions there was no overall relationship between drive content and retention.

Under the impact of the drug, however, such a relationship emerged. Table 4 shows that for the drug Ss but not for the placebo Ss, there was a significant interaction between conditions and theme-lists. This took the form of a greater impairment on the neutral theme-lists than on the drive theme-lists. Table 3 shows that the drug Ss on their experimental day showed a clearcut differ-

ence between both drive theme-lists and their neutral controls.

In order to get a clearer view of the effect of the drug on the four theme-lists, each S's experimental day scores were compared to his own pre-experimental day scores taken as his baseline. An effect score was derived for each experimental day reproduction by subtracting from it S's average score on his two pre-experimental day reproductions. This effect score is a measure of the direction and extent of change under the experimental conditions. Table 5 summarizes the effect score findings.

It shows that for the placebo Ss none of the four theme-lists underwent a significant effect. For the drug Ss neither the aggressive or the sexual theme-list underwent a significant effect, but the two control theme-lists each showed a substantial and significant effect. No matter which way the comparisons are made, whether within or between groups, the finding is clear: there was a differential effect among the drug Ss.

While the drug Ss showed virtually no effect on the sexual theme-list, the difference between the groups on the sexual theme-list achieves a measure of significance ($p <$

TABLE 5

A Comparison of the Effect Scores of the Experimental Day's Theme-Lists (S's Scores are Based on his Average Pre-experimental Day Score)

	Theme-lists			
	Aggres- sive	Aggres- sive- Control	Sexual	Sexual- Control
Drug Ss	14		11	
N				
Mean	-4.50	-11.14	-0.91	-10.18
' from 0	2.08*	4.13†	<1	3.03‡
' difference	2.38‡		2.54‡	
Placebo Ss	10		10	
N				
Mean	-1.10	+0.50	+3.80	+1.80
' from 0	<1	<1	1.92*	1.09
' difference	<1		<1	
t of difference between Drug Ss and Pla- cebo Ss	1.15	3.54†	1.78*	3.21†

* $p < .10$.

† $p < .01$.

‡ $p < .05$.

.10). This is a result of the fact that the placebo Ss showed an improvement on the sexual theme-list (in line with its overall superiority in memorability) that likewise approaches significance, at the .10 level. It may be, then, that the drug did have an effect on this theme-list insofar as it prevented an improvement on it that would otherwise have occurred. It also bears noting that the drug Ss' impairment on the aggressive theme-list is not far from significant ($p = .08$). Perhaps the safest conclusion, then, is that the drive theme-lists too underwent an impairment under the drug. But it was clearly of significantly smaller proportions and less reliable than the impairment suffered under the drug by the neutral theme-lists.

The results of the next-day reproductions may be summarized briefly. The placebo Ss showed the same amount of forgetting on the experimental and post-experimental days, while the drug Ss forgot more on the experimental day than they did on the post-

experimental day ($F = 4.55, p < .05$). This finding is difficult to evaluate because the drug Ss, having learned less on the experimental day, had less to remember on the post-experimental day. Moreover, the difference between the groups in the amount they forgot on the experimental day—the drug Ss showing more forgetting than the placebo Ss—is significant only at the .10 level ($F = 2.54$). And neither group showed an interaction between drive content and forgetting. It is perhaps noteworthy that on the post-experimental day the drug Ss forgot no more of the experimental day's theme-lists than did the placebo Ss. But this finding is also difficult to evaluate since the drug Ss had less to remember.

In any case, one can conclude that the drug exerted a less substantial and less reliable effect on long-term retention (24-hour) than it did on short-term retention (five-minute). And it seems a safe conclusion that once the effect of the drug was past, our Ss were well able to recall what they had been able to learn during its impact.

DISCUSSION

It is not surprising, in view of its widespread effects on cognitive functioning, that LSD caused an impairment in Ss' ability to learn and retain connected verbal material. What is noteworthy, however, is that this impairment should occur primarily on neutral material. The drive theme-lists, in sharp contrast to the neutral ones, suffered an impairment that was relatively small and quite unreliable. It is also noteworthy that the effect was restricted to accuracy, and the drug produced no changes in amount of intrusion and distortion. It bears mentioning, however, that isolated instances of gross intrusions and distortions did occur under the drug and never under the placebo; but they occurred too infrequently to affect the group's scores.

Among the remarks most consistently made during the theme-list procedure by Ss under the drug was that they experienced a

stat
from
tary
pow
tion
of th
turbo
but t
an i
and f
porte
anoth
contr
keepi
ficult
portec
currec
theme
seeme
compl
organi
("Eve
similar
The
relative
to illus
tions t
so far
of drive
Case
a good
had to
edly. W
theme-l
what he
were int
look aw
having
things as
as thoug
a pendul
I get se
swaying
hind the
than me
Monkey,
thought
taking an

state of passivity ("My thoughts wander from one thing to the next"), a loss of voluntary control ("I don't have any will power"), and a disturbance of concentration ("It's hard to concentrate"). In some of the cases motivation seemed to be disturbed ("I don't want to concentrate"), but this seemed clearly to be secondary to an inability to concentrate. Distraction and fluidity of thinking were frequently reported, and most Ss spoke in one way or another of their minds wandering out of control, of inability to listen, of difficulty keeping their thoughts in order, and of difficulty staying with the task. Some Ss reported that the greatest disturbance occurred during the presentation of the new theme-list; recalling yesterday's theme-lists seemed much easier for them. Many also complained that the theme-list seemed disorganized and the themes merged together ("Everything is muddled"; "They were so similar in the middle").

The protocols of two Ss, who suffered a relatively extreme drug effect, are included to illustrate the phenomenon. Their reactions to the theme-lists were typical only so far as they showed the differential effect of drive content.

Case 1: Under the drug Tommy giggled a good deal. He was very distractible, and had to be directed back to the task repeatedly. When asked to remember yesterday's theme-lists he could recall about a third of what he had retained of each. His recalls were interrupted by remarks such as, "You look awfully big up there, Dr. Paul. Oh, I'm having difficulty with it. So many different things are going on. Everything is quivering, as though somebody is swinging a lamp like a pendulum. Oh my. The walls are swaying; I get seasick. I can see people walking, swaying their backs and behinds. I'm behind them like a little boy. They're bigger than me." After the new theme-list, The Monkey, was presented to him, he said, "I thought you were going on, and I'm not taking any of it in. Number six, a hairy paw

scooped it up. That one I clearly took in." But he could not recall anything more. (Accuracy = 6.) In the afternoon, during the presentation of The Vampire, he interrupted, saying, "Oh, I just remembered something for my autobiography: my mother watching me fight another boy." He was directed back to the task, and this was his reproduction: "The bearded captain something, something. And his something paw. Why did I think of hairy paw? On a hot night. Oh dear. They guzzled, guzzled something down. Sailors, waterfront. Why do I think of that? Number six, she watched the bloody fight. And after that he plunged a bread knife deep; I don't know into what. That's all I remember." (This reproduction—fragmented and disorganized as it is—earns an accuracy score of 23.)

Case 2: When Oscar was asked to recall the pre-experimental theme-lists he could only remember "the sexy one," and he was able to reproduce a third of what he had retained of it then. He did not recall Strange Lyrics at all, remarking, "I feel too good to care. I'll have to concentrate more than I can do. Oh hell. I don't remember it. I probably could if I tried harder. It's a fun subject." After The Monkey was presented to him, he said, "Well, The Monkey was the title, I think. Number one, the general... something about the extravagantly dressed general. I know this is all wrong. Oh, I don't remember. Something about fiddled with his medals." After this gross intrusion he refused to go on, saying, "I don't really remember the others. I'm too high. I don't really feel like doing it because I'm so drunk." Further encouragement did not prevail. (Accuracy = 3.) In the afternoon, when The Vampire was presented, he did a little better. "Do you want the title?" he asked. "The Vampire. I have hardly any memory at all. Something about drinking burning rotgut. I don't know whether... Let's see, if there's anything I can remember about the whole sequence at all. Somebody got stabbed there

along about six or seven. Stabbing came to mind. That's all." (Accuracy = 8.)

The nature of the thinking disturbance that Linton and Langs (3) observed from a study of the drug day protocols and responses to the monitoring questionnaire corresponds closely to the picture given by the theme-list protocols. They observed that our Ss reported impairment of judgment and concentration, loss of control over their thoughts, and the feeling that their attention seemed to be captured involuntarily. A number of the questionnaire items which were highly accepted under the drug reflect a loss of control over the deployment of attention, manifested in the Ss as trouble in keeping their attention on the task at hand and their attention's being drawn elsewhere without their volition.

What emerges, then, as an explanation for the finding that drive content facilitated retention under the drug is that this content "captured" attention. For the Ss in this state of consciousness, the drive material was more vivid: it did not require much voluntary expenditure of attention; it was drawn in by forces which the S considers outside of his voluntary jurisdiction.

Perhaps one should go no further than to propose that the drive theme-lists differed from their neutral counterparts with respect to the property of vividness. Under impoverished conditions of attention and concentration the variable of vividness comes to play an influential role. But it is tempting to ask further: Why is it more vivid? and why should it capture the attention of the drugged person? And here is where psychoanalytic propositions about the role of drives in primary process functioning and the role of autonomy in altered states of consciousness enter.

To put it simply: The waking state of consciousness is characterized by the ca-

capacity for the relative autonomy of cognitive functioning, the capacity to expend attention cathexis relatively free from the interference from drives and affects. In an altered state of consciousness this relative autonomy is impaired, and the drives comes to play an organizing and selecting role in cognitive functioning. There is, then, a relation between emotions and memory (7); but it is a relation that is vitally mediated by state of consciousness.

REFERENCES

1. KLEIN, G. S. Consciousness in psychoanalytic theory: Some implications for current research in perception. *J. Amer. Psychoanal. Ass.*, 7: 5-33, 1954.
2. KOTT, M. G. Learning and retention of words of sexual and nonsexual meaning. *J. Abnorm. Soc. Psychol.*, 50: 378-382, 1955.
3. LINTON, H. B. AND LANGS, R. J. Subjective reactions to Lysergic Acid Diethylamide (LSD-25). *A.M.A. Arch. Gen. Psychiat.*, 6: 352-368, 1962.
4. LOEWALD, H. W. Hypnoid state, repression, abreaction and recollection. *J. Amer. Psychoanal. Ass.*, 3: 201-210, 1955.
5. PAUL, I. H. Some preliminary studies of memory styles: Importers versus Skeletonizers. Paper read at annual convention of the American Psychological Association, Washington, D. C., August, 1958.
6. PAUL, I. H. Studies in remembering: The reproduction of connected and extended verbal material. *Psychol. Issues, Monogr. No. 2*. International Universities Press, New York, 1959.
7. RAPAPORT, D. *Emotions and Memory*, 2nd ed. International Universities Press, New York, 1950.
8. RAPAPORT, D. The theory of ego autonomy: A generalization. *Bull. Menninger Clin.*, 22: 13-35, 1958.
9. RIGGS, M. M. Recall and organization of aggressive words under varied conditions of emphasis. *Percept. Mot. Skills*, 6: 273-284, 1956.
10. RUBINFINE, D. L. Notes on a theory of reconstruction. Paper read at Austen Riggs Center, Stockbridge, Mass., 1961.
11. SMITH, J. G. Influence of failure, expressed hostility and stimulus characteristics on verbal learning and recognition. *J. Personality*, 22: 475-493, 1954.

T.
to e:
of s;
men
the
chro
and
ferer
they
leges
diffe
occu
diffe
stres
also
pecte
expe
is pc
and
by d
Adm
patte
biolo
are f
socie
sexes
ences

Th
hypot
two
patien
chron

¹ Int
The S
sey. T
based
MY 3
Center
² M
sey.