

Spring 1962

Conditioning a Class of Verbal Behavior in Schizophrenics and Normals Using Both Verbal and Gestural Reinforcement

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CONDITIONING A CLASS OF VERBAL BEHAVIOR
IN SCHIZOPHRENICS AND NORMALS
USING BOTH VERBAL AND GESTURAL REINFORCEMENT

being

A Thesis Presented to the Graduate Faculty
of the Fort Hays Kansas State College in
Partial Fulfillment of the Requirements for
the Degree of Master of Science

by

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Date

May 15, 1962

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ABSTRACT

This study was designed to determine some of the possible differences in normal and schizophrenic verbal behavior. Subjects were ten persons at the Larned State Hospital who had been diagnosed as schizophrenic and ten normals matched to the schizophrenics as to age, sex, and education. All subjects were requested to tell two stories including themselves, two other people, and the experimenter. References to the experimenter were reinforced by means of verbal approval (such as "good" and mmm-hm") during the second story. The frequency of references to the experimenter was computed for each story. Comparisons were made on a group basis and all possible comparisons were made between and within the groups.

Significant differences were obtained in comparing non-reinforced normal with reinforced normal subjects and in comparing reinforced normal subjects with reinforced schizophrenic subjects. Schizophrenic subjects showed greater variability in their behavior and, as a group, their reinforced stories did not differ significantly from their non-reinforced stories.

ACKNOWLEDGEMENT

The author gratefully acknowledges the help of the staff at Larned State Hospital for their gracious help which was rendered in addition to their already full schedules. Special thanks are due to Dr. Steve Pratt, chief psychologist, for making the institutional facilities available, and to Mr. Robert Hetrick for his suggestions and special aid in making records and subjects available.

To the subjects, who must remain anonymous, goes the authors many thanks for making this project possible by undertaking the difficult and spontaneous tasks required.

For guidance and help, Dr. William F. Gwynn and Dr. L. Crocker Peoples are gratefully acknowledged. To Mr. John Chappell and Mr. Robert Witt who served in the role of critic and counselor as committee members, the author expresses her gratitude.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
II. STATEMENT OF PROBLEM	9
III. PROCEDURE	10
The Subjects	10
Controls	10
Method	13
IV. RESULTS	16
V. DISCUSSION	26
VI. SUMMARY	35
REFERENCES	38
APPENDIX A. Scoring Instructions	41
APPENDIX B. Scoring Sheet	43
APPENDIX C. Raw Data	47

LIST OF TABLES

TABLE	PAGE
1. Schizophrenic Subject Variables	11
2. Normal Subject Variables	12
3. Frequency and Per cent of T responses for Normal and Schizophrenic Subjects Under Conditions of Non-reinforcement	17
4. Frequency and Per cent of T responses for Normal and Schizophrenic Subjects Under Conditions of Reinforcement	18
5. Frequency and Per cent of T Responses for Non- reinforced Normal as Compared to Reinforced Normal Subjects	19
6. Frequency and Per cent of T Responses for Non- reinforced Schizophrenic as compared to Reinforced Schizophrenic Subjects	20
7. Frequency and Per cent of T Responses for Reinforced Normal as compared to Non-reinforced Schizophrenic Subjects	21
8. Frequency and Per cent of T Responses for Non- reinforced Normal as Compared to Reinforced Schizophrenic Subjects	22

CHAPTER I

INTRODUCTION

The purpose of this research is to investigate certain factors relating to the verbal behavior of normal and schizophrenic subjects. People in an interpersonal situation respond to the verbalizations of those around them. They are influenced and in a sense controlled by the verbal behavior of others. At the same time, the individual exerts a similar influence on others. Such responsiveness on the part of the subject is essential to experiments in conditioning. The degree of conditionability might be thought of as a measure of an individual's ability to respond to the behavioral cues of others. Experimental evidence on the nature of verbal conditioning has accumulated rapidly in the past few years (see Krasner, 1958; Salzinger, 1959). The conditionability of psychotics has also been explored, but, with a few exceptions, for example Hartman (1955), the results have not been compared with a control group of normals. A comparison of one aspect of verbal behavior of normals and psychotics under a situation similar to a psychotherapy situation might possibly yield information leading to a better understanding of the schizophrenic in psychotherapy. The ability to respond to the verbal behavior of others is essential in "any interpersonal interaction, and psychotherapy is no exception" (Bandura, 1961).

In this experiment a group of normals and a matched group

of schizophrenics were conditioned to the same class of verbal behavior and a comparison was made between and within the two groups.

Schizophrenia as a neuro-psychiatric diagnostic category is characterized by severe behavioral disturbances in reality relationships and by marked affective, intellectual and perceptual disturbances. Difficulties in relating to other people are apparent. Since there is much disagreement as to just what schizophrenia is, and even whether there is such an entity, in this study "schizophrenic" will refer to individuals who have been diagnosed as having schizophrenia.

Schizophrenic persons occupy nearly one half of the mental hospital beds in the United States yet the same patients account for only 20 to 25 per cent of the first admissions. This discrepancy is due, in part, to the chronicity of the condition. Drug therapy may result in a shortening of hospitalization, but there is still a need for improving our therapeutic approaches to the hospitalized schizophrenic patient. The responsiveness of the schizophrenic to psychotherapy has in the past, been considered nearly non-existent possibly because therapists neither had the patience, the time, nor the knowledge to effectively alter the schizophrenics' behavior. However, recent reports of success with schizophrenics in psychotherapy hold the promise that at least some groups of schizophrenics may be capable of responding to such treatment (Bellak, 1958).

Successful and constructive psychotherapy, according to most traditional psychotherapists, depends to some degree on the extent

to which the patient can trust the therapist. Such a view holds that an interpersonal relationship must be established between patient and therapist, the latter serving as a "bridge to reality." (Bellak, 1958, pp. 338; Noyes, 1957, pp. 572). This requires not only the confidence and cooperation of the patient but patience, tolerance, and acceptance by the therapist. Even with a "perfect" therapist, it is extremely difficult to establish this therapeutic relationship with schizophrenics as they are often incapable of developing therapeutically usable interpersonal relationships. In fact, the psychoanalytic school once postulated the theory that the capacity for transference in the schizophrenic is actually destroyed (Noyes, 1957, pp. 334).

Some investigators such as Wolpe, Skinner, and Miller and Dollard, have reported remarkable behavioral changes through the application of such learning principles as counter conditioning, discrimination, extinction, and various methods of reward. Under these conditions the transference relationship has not been considered necessary for successful treatment (Bandura, 1961). In only one of Pascal's approaches to behavioral change is generalization promoted and encouraged and this, according to Pascal, and Miller and Dollard, is the same as transference (Pascal, 1959; Dollard and Miller, 1950). Yet Pascal has reported success with all three of his approaches. Principles of learning are utilized to some extent in any psychotherapeutic approach though this may be done

unwittingly and the process may bear a different label (Dollard and Miller, 1950). The result of the above investigators suggest that therapy in the future may involve a more intense application of the learning principles, and the transference relationship as it is usually thought of may become less necessary in bringing about behavioral changes.

In the therapy situation a patient's remarks can be classified into three general areas: references to the environment, himself, and the therapist (Dinoff, et. al., 1960). Various types of therapy emphasize the importance one or another of these, but regardless of the focus, any psychotherapeutic relationship is dependent upon the client's ability to respond to the therapist and the extent to which he can use the therapist's reaction to modify his own behavior (Bellak, 1958, p. 337, Pennington and Berg, 1954, p. 486). People in therapy often begin by talking about their environment. When they begin to feel at ease they talk more about themselves, and, unless therapy is terminated, they eventually include the therapist more into their verbalizations. When patients begin to bring the therapist into their remarks transference or generalization is beginning. Rogers found that as his clients progressed they began to talk less about the environment and more about themselves. It is possible that had he extended the length of the treatment, he may have found the patient talking more in terms of the therapist (Dinoff et. al., 1960).

Dinoff and his colleagues (1960) hypothesized that the success a therapist has in establishing a relationship with a patient might

be determined by the ease with which the patient progresses from references to the environment to himself to the therapist. Enlarging on this hypothesis, it is possible that the extent to which an individual is capable of entering productively into therapy might be determined by his ability to be conditioned to include the therapist in his verbalizations. This might be characterized by a rise in the frequency of references to the therapist.

Review of the Literature. One question which might be raised is whether schizophrenics are "off the distribution" insofar as conditionability is concerned. Can schizophrenics be conditioned? If schizophrenia is only an extreme psychological disturbance, differing from normals only in degree, then conditionability should also differ only in degree, if at all. It has been established that some schizophrenics can be conditioned. Some investigators have limited their experiments to operant conditioning. Among these, one of the most relevant to the present study is reported by Lindsley and Mednick (1958) who found the schizophrenics who were testable by at least one clinical test were high operant responders. Lindsley reports elsewhere (1956) that he has been successful in using an operant conditioning technique as a research tool in the measurement of various types of psychotic, particularly schizophrenic, behavior.

Among the verbal conditioning experiments is one by Salzinger and Pisoni (1958, 1960) who have shown that the conditioning of self-referred affect statements was possible with 20 hospitalized

schizophrenics. With two schizophrenic males as subjects Krasner (1958) found that a reinforced class of verbalization varies systematically as a function of examiner behavioral cues. Two doctoral dissertations are concerned with similar subjects (Klein, 1954; Hartman, 1955). Klein (1954), investigating types of extinction, was able to condition three groups of schizophrenic subjects to begin sentences with a previously selected class of words. Using the same technique but studying the effect of different types of reinforcement, Hartman (1955) was unable to draw any definite conclusions regarding the conditionability of schizophrenics as compared to normals, but tentatively suggested that normals might be less persistent in extinction than are schizophrenics, which corroborates the clinical impression that schizophrenics are perseverative.

Of the numerous reports on verbal conditioning those which appear to be most readily identified with the psychotherapeutic interview and as a result most applicable to this study are the investigations which have utilized the story telling or interview method. In this method an arbitrary class or category of words is selected to be reinforced by the examiners during a situation in which the subject is either telling a story or taking part in a clinical interview. In an experiment in which the examiners were members of a class in the psychology of learning, Verplanck (1955) found that it was possible to control the content of a conversation through reinforcement. In this particular investigation,

the subjects were not aware that they were part of an experiment and the experimental setting was that of an ordinary conversation.

Through the use of reinforcement McNair (1957) was able to increase the rate of verbalization in normal subjects while they were talking about photographic slides.

There is a limited number of investigations utilizing a story telling or interview setting with schizophrenic subjects. Mock (1957) had his schizophrenic subjects tell twenty 10 minute stories with rest intervals. Arranging the sessions into four blocks, he positively reinforced the first and third block of stories and negatively reinforced the second and fourth blocks of stories. He reported that the positively reinforced responses increased in the first block, decreased under negative reinforcement in the second block, but that the behavior of the subjects became inconsistent in the following two blocks. However, Krasner (1958) employing a similar method with schizophrenic subjects reported favorable results throughout the experiment. His subjects' references to the preselected class of words increased or decreased in relation to the examiner's reinforcement. Using a group of hospitalized schizophrenics and a normal control group, Salzinger and Pisoni (1958) showed that it was possible to condition self-referred affect statements in both groups during an "otherwise usual clinical interview." By employing two different examiners these authors also showed "that a difference in sources of reinforcement need not produce discrepant results."

In the numerous experiments on verbal conditioning reinforcement has taken the form of verbal cues and various types of mechanically administered cues. Verbal cues such as "good", "mumma-hm", "right", "fine" have been used by Salzinger and Pisoni (1958, 1960), Verplanck (1955) and others who have been cited by Krasner (1957) in an excellent review. Non verbal gestural cues include head shake or nodding, leaning forward in the chair and smiling (Krasner, 1957). Mechanical cues such as light flashes, buzzers and bell tones have been successfully administered by Greenspoon (1955) and McNair (1957). Generally however, mechanical reinforcements do not seem to have as effective reinforcing properties as either the verbal or gestural cues (Krasner, 1958).

CHAPTER II

STATEMENT OF PROBLEM

Evidence has been presented and assumptions made suggesting that the extent to which an individual can be conditioned might aid in determining his ability to enter into and profit by a therapeutic relationship. It is also possible that conditioning may be developed and conducted in such a way that it might be used as a therapeutic technique in and of itself in which case the transference relationship, although it may exist, would become unimportant in producing behavioral change. There is the possibility that if some of the factors relating to the verbal behavior of normals and schizophrenics could be uncovered, the understanding of schizophrenia might be enhanced.

It is the purpose of this study to attempt to determine some of the possible differences in normal and schizophrenic verbal behavior. This investigation is not intended to be definitive, but it is hoped that it will stimulate interest in this area, produce questions regarding it, and, in general, be hypothesis generating.

Because of the tentative nature of the arguments presented in favor of this study and because of the speculative and exploratory nature of the investigation a null hypothesis of no difference between and within groups will be employed.

CHAPTER III

PROCEDURE

The Subjects:

The subjects for this study were three male and seven female patients at the Larned State Hospital who had been diagnosed as chronic schizophrenic and three male and seven female normal subjects matched to the schizophrenics with regard to age, sex, and education. Brief descriptions of the subjects are presented in Tables I and II.

Controls:

It was decided on an a priori basis that the following variables would be incorporated into the design.

1. The age range of both groups of subjects should be from 20 to 40 years.
2. Subjects in both groups should have at least a high school education.
3. Any difference which might occur as a result of examiner variables should be controlled by having the same person serve as the experimenter throughout the study.
4. Possible effects of different experimental settings would be reduced by having each subject meet with the examiner under conditions as nearly like that of a therapeutic situation as possible.
5. Two judges would be employed to score the stories.
6. The method of scoring subject's stories would be held

TABLE I

SCHIZOPHRENIC SUBJECTS VARIABLES

Subject	Date Birth	Sex	Race	Relig.	Mar.Stat.	Educ.	Adm.Date	Prev.Hosp.	Occup.	Established Diagnosis
1	12-32	F	W	Prot.	M	Col. 2 yrs.	4-59	No	Steno.	Schizophrenic reaction, chronic, undifferentiated type.
2	12-32	F	W	Prot.	M	Col. 1½ yrs.	7-61	Yes	House wife	Schizophrenic reaction, chronic, undifferentiated type.
3	3-35	F	W	Prot.	D	H.S.	10-61	No	Sec'y.	Schizophrenic reaction, chronic, undifferentiated type, paranoid features.
4	3-35	F	W	Cath.	D	H.S.	8-58	Yes	Clerk- typist	Schizophrenic reaction, chronic, undifferentiated type.
5	9-23	F	W	Prot.	M	Col. 1 sem.	5-58	Yes	Boeing	Schizophrenic reaction, chronic, undifferentiated
6	7-23	F	W	Prot.	M	H.S.	9-61	Yes	House wife	Schizophrenic reaction, chronic, undifferentiated type, paranoid features.
7	9-23	F	W	Prot.	M.	H.S.	8-61	No	Cleri- cal	Schizophrenic reaction, chronic, undifferentiated type.
8	8-42	M	W	Prot.	Sn.	H.S.	9-61	Yes	Stu- dent	Schizophrenic reaction, chronic, undifferentiated type.
9	11-34	M	W	Cath.	Sn.	Col. 2½ yrs.	1-60	Yes	Stu- dent	Schizophrenic reaction, chronic, undifferentiated type
10	5-31	M	W	Prot.	Sn.	Col. 3yrs.	11-61	Yes	Stu- dent	Schizophrenic reaction, chronic, undifferentiated in remission.

TABLE II
 NORMAL SUBJECT VARIABLES

Subject	Date birth	Sex	Race	Relig.	Mar. Stat.	Educ.	Occupation
1	6-32	F	W	Prot.	M	Col. 2 yrs.	Housewife
2	9-32	F	W	Prot.	M	Col. $1\frac{1}{2}$ yrs.	Housewife
3	11-35	F	W	Prot.	M	H.S.	Housewife
4	2-35	F	W	Prot.	M	H.S.	Housewife
5	7-23	F	W	Cath.	M	H.S.	Housewife
6	12-23	F	W	Prot.	M	H.S.	Housewife
7	6-23	F	W	Prot.	D	H.S.	Steno.
8	5-42	M	W	Prot.	Sn.	H.S.	Laborer, oil fields
9	9-34	M	W	Prot.	Sn.	Col. $2\frac{1}{2}$ yrs.	Student
10	11-31	M	W	Prot.	Sn.	Col. 3 yrs.	Student

constant by giving each judge the same written instructions consisting of precise and comprehensive criteria.

7. The judges would receive some training in scoring stories by scoring the stories collected by the examiner from pilot subjects.
8. Each story would be scored by both judges.
9. The stories would be arranged and distributed in such a way that it would be impossible for the judges to determine to which group of subjects a particular story belonged, aside from the content of the stories.
10. When a major disagreement would occur between the two judges scoring one story, a third judge would be asked to score the story and the decision of the two judges in agreement would be used.

All of the above controls were met.

Method:

Before any instructions were given to the subject, the examiner entered into a conversation with the subject in order to establish rapport with him. Since length instructions may have been confusing to the schizophrenic subjects, some instructions were included in the course of this conversation. In this way each subject was told that he would be asked to tell two stories utilizing any plot or setting desired and that the stories would be tape recorded.

When rapport was established in the opinion of the experimenter the following instructions were given to the subject:

I would like to have you tell two stories including you, me, and two other people as characters. Make them about five minutes long. Any questions? Remember to include you, me, and two other people in the story.

Questions were answered by repeating the part of the instructions which was relevant to the question. No structure as to the subjects of the story was given. While the subject was telling the first story, the examiner remained silent and motionless. Though some subjects may have interpreted this silence as punishment, this should not have effected the final results since all subjects were treated alike. During the second story the subject was reinforced by the examiner for each reference made to the examiner. Reinforcement consisted of nodding the head, leaning forward in the chair, smiling or remarks such as "mmm-hm," "good," or a combination of these. The above reinforcements were administered in a variable order in an effort to render the situation more realistic. If any subject ended either story short of two minutes, the examiner said, "Please make the story longer," or "tell me more." Subjects who were unable or unwilling to tell stories or follow the directions or who in general could not cooperate by telling stories were discarded.

Each story was presented in typed form to two judges who were naive regarding the purpose or rationale behind the study. The judges were instructed in terms of concise, unambiguous criteria

to consider each separate phrase in each story and to determine to which of the following categories it pertained: environment (E), examiner (T), subject (P) or an ambiguous (A) category.

They were asked to designate each clause as E, T, P, or A depending on which category the clause has been placed. (See appendix I for scoring instructions.) Scoring sheets were provided for each story.

CHAPTER IV

RESULTS

The data were analyzed in terms of frequency of occurrence of the criterion response in each story. The criterion response represents references to the experimenter. A binomial expansion was utilized in determining the direction of the differences in results and a Wilcoxon T was employed to determine the magnitude of the differences between or within the groups. Computation of these values followed the method outline by Jenkins (1956). Because the stories varied somewhat in length, the per cent of references to the experimenter in relation to the total number of phrases was also used in analysis.

During the first, non-reinforced, story normal subjects made a mean total of 13.02 per cent T responses as compared to 10.82 per cent T responses made by schizophrenic subjects under the same condition. The results of this comparison are shown in Table 3, page 17. The P value obtained for this difference was not significant suggesting that there may be no difference between normal and schizophrenic subjects with regard to the mean number of T responses emitted in the situation in which they were not reinforced. Group variability will be discussed later.

Normal subjects increased their T responses to 46.24 per cent during the reinforced story while schizophrenic subjects increased theirs to 13.45 per cent during the reinforced story.

TABLE III

FREQUENCY AND PER CENT OF T RESPONSES FOR
NORMAL AND SCHIZOPHRENIC SUBJECTS UNDER
CONDITIONS OF NON-REINFORCEMENT

Subject	Normal		Schizophrenic		Difference
	Frequency	Per cent	Frequency	per cent	Per cent
1	1	2.85	24	82.75	-79.90
2	2	4.16	10	29.41	-25.25
3	7	11.66	0	0.0	+11.66
4	15	39.47	2	4.44	+35.03
5	1	3.57	0	0.0	+ 3.57
6	12	20.0	4	10.52	+ 9.48
7	8	20.0	17	73.91	-53.91
8	2	2.40	0	0.0	+ 2.40
9	7	20.58	4	9.30	+11.28
10	4	14.81	1	5.26	+ 9.55
Mean	5.9	13.02	6.2	10.85	
Variance	23.2		67.5		

Binomial P = .172
 Wilcoxon T = 26.0 not significant (P .01 = 3.06)
 F ratio = 2.9 not significant

TABLE IV

FREQUENCY AND PER CENT OF T RESPONSES FOR NORMAL
AND SCHIZOPHRENIC SUBJECTS UNDER CONDITIONS OF
REINFORCEMENT

Subject	Normal		Schizophrenic		Difference
	Frequency	Per cent	Frequency	Per cent	Per cent
1	22	44.89	2	3.33	+41.56
2	47	47.0	23	38.33	+ 8.67
3	25	39.68	14	46.66	- 6.98
4	21	35.59	5	11.62	+23.97
5	45	75.0	0	0.0	+75.0
6	17	28.81	7	11.66	+17.15
7	27	41.53	3	8.33	+33.20
8	24	54.54	0	0.0	+54.54
9	17	60.71	16	31.37	+29.34
10	20	54.05	2	12.50	+41.55
Mean	26.5	46.24	7.2	13.45	
Variance	116.1		61.5		

Binomial P = .011
 Wilcoxon T = 1.0, $P < .01$ ($P .01 = 3.06$)
 F ratio = 1.9, not significant

TABLE V

FREQUENCY AND PER CENT OF T RESPONSES FOR NON-
REINFORCED NORMAL AS COMPARED TO REINFORCED
NORMAL SUBJECTS

Subject	Non-reinforce		Reinforced		Difference
	Frequency	Per cent	Frequency	Per cent	Per cent
1	1	2.85	22	44.89	-42.04
2	2	4.16	47	47.00	-42.84
3	7	11.66	25	39.68	-28.02
4	15	39.47	21	35.59	+ 4.00
5	1	3.57	45	75.00	-71.43
6	12	20.00	17	28.81	- 8.81
7	8	20.00	27	41.53	-21.53
8	2	2.40	24	54.54	-52.14
9	7	20.58	17	60.71	-40.13
10	4	14.81	20	54.05	-39.24
Mean	5.9	13.02	26.5	46.24	
Variance	23.2		116.1		

Binomial P = .011
 Wilcoxon T = 1.0, P < .01 (P .01 = 3.06)
 F ratio = 5.0, P .05 (two tailed test)

TABLE VI

FREQUENCY AND PER CENT OF T RESPONSES FOR NON-REINFORCED
SCHIZOPHRENIC AS COMPARED TO REINFORCED SCHIZOPHRENIC
SUBJECTS

Subject	Non-reinforced		Reinforced		Difference
	Frequency	Per cent	Frequency	Per cent	Per cent
1	24	82.75	2	3.33	+80.42
2	10	29.41	23	38.33	+ 8.92
3	0	0.0	14	46.66	-46.66
4	2	4.44	5	11.62	- 7.18
5	0	0.0	0	0.0	- 0.0
6	4	10.52	7	11.66	- 1.14
7	17	73.91	3	8.32	+65.59
8	0	0.0	0	0.0	+ 0.0
9	4	9.30	16	31.37	-22.07
10	1	5.26	2	12.50	- 7.24
Mean	6.2	10.85	7.2	13.45	
Variance	67.5		61.5		

Binomial P = .172
 Wilcoxon T = 20.5 not significant (P .01 = 3.06)
 F ratio = 1.1 not significant

TABLE VII

FREQUENCY AND PER CENT OF T RESPONSES FOR REINFORCED
NORMAL AS COMPARED TO NON-REINFORCED SCHIZOPHRENIC
SUBJECTS

Subject	Reinforced Normal		Non-reinforced Schizophrenic		Difference Per cent
	Frequency	Per cent	Frequency	Per cent	
1	22	44.89	24	82.75	-37.86
2	47	47.00	10	29.41	+17.59
3	25	39.68	0	0.0	+39.68
4	21	35.59	2	4.44	+31.15
5	45	75.00	0	0.0	+75.00
6	17	28.81	4	10.52	+17.29
7	27	41.53	17	73.91	-32.38
8	24	54.54	0	0.0	+54.54
9	17	60.71	4	9.30	+51.41
10	20	54.05	1	5.26	+48.79
Mean	26.4	46.24	6.2	10.85	

Binomial P = .055

Wilcoxon T = 9.0

not significant (P .01 = 3.06, P .10 = 10.79)

TABLE VIII

FREQUENCY OF PER CENT OF T RESPONSES FOR NON-REINFORCED
 NORMALS AS COMPARED TO REINFORCED SCHIZOPHRENIC SUBJECTS

Subject	Non-reinforced Normal		Reinforced Schizophrenic		Difference Per cent
	Frequency	Per cent	Frequency	Per cent	
1	1	2.85	2	3.33	- .48
2	2	4.16	23	38.33	-34.17
3	7	11.66	14	46.66	-35.00
4	15	39.47	5	11.62	+27.85
5	1	3.57	0	0.0	+ 3.57
6	12	20.00	7	11.66	+ 8.34
7	8	20.00	3	8.33	+11.67
8	2	2.40	0	0.0	+ 2.40
9	7	20.58	16	31.37	-10.79
10	4	14.81	2	12.51	+ 2.30
Mean	5.9	13.02	7.2	13.45	

Binomial P = .377

Wilcoxon T = 26.0 not significant (P = .01 = 3.06)

The results reveal that the difference between the two groups under reinforcement conditions is significant beyond the .01 level suggesting that normal persons are more conditionable than those diagnosed as schizophrenic. These results are presented in Table 4, page 18.

The difference obtained in comparing non-reinforced normal subjects with reinforced normal subjects is significant at the .01 level. During the first story normal subjects made 13.02 per cent of the total responses in reference to the experimenter. The per cent of T responses was increased to 46.24 during the second, reinforced story. These results are presented in Table 5, page 19.

There was no significant difference within the group of schizophrenic subjects when comparing reinforced conditions with non-reinforced conditions. During the first story 10.85 per cent of the responses were in reference to the experimenter. This was increased to 13.45 per cent during the second story. This data is summarized and presented in Table 6, page 20.

The last two comparisons were made between reinforced normal and non-reinforced schizophrenic subjects and non-reinforced normal and reinforced schizophrenic subjects. These differences were computed primarily for the purpose of having all possible comparisons between and within the two groups. The per cent of T responses made by reinforced normal subjects and non-reinforced schizophrenic subjects were 46.24 per cent and 10.85 per cent respectively. This difference was significant at the .10 level. There was no significant difference between the groups for the non-reinforced story and there

was no significant increase in T responses during the second stories of the schizophrenic subjects. But normal subjects did show a significant increase in criterion responses. As a result this comparison is similar to the comparison of reinforced normal and reinforced schizophrenic subjects. These results are shown in Table 7 at page 21.

There was no significant difference between non-reinforced normal subjects and reinforced schizophrenic subjects. This is similar to comparing non-reinforced schizophrenic stories with reinforced schizophrenic stories since the normal and schizophrenic groups under non-reinforced conditions were quite alike. The percent of T responses made by non-reinforced normal subjects and reinforced schizophrenic subjects were 13.02 and 13.45 respectively. These results are presented in Table 8, page 22.

Comparisons between the two groups for the four categories of responses (T, P, E, A) were made to present an over all view of the data. This information is summarized in Appendix C.

It can be seen in Tables 3 and 5, pages 17 and 19 that the variability of the various groups is quite high. One might expect that schizophrenic subjects would be more variable than normal subjects, especially under operant conditions. This was borne out by the data, in that the variance for the schizophrenic group under non-reinforced conditions was 67.5 and only 23.2 for the normal subjects. This difference just misses significance at the .05 level. The only significant difference among group variances

was between the non-reinforced normals and the reinforced normals. This difference was significant at the .05 level.

A total of 2039 responses was made by the two groups of subjects. The first two judges agreed in scoring 98.23 per cent of these. A third judge was requested to score the 36 responses on which the first two judges did not agree. The judgement of the two judges who agreed on these 36 responses was used in computation.

CHAPTER V

DISCUSSION

Of the six comparisons made between and within groups, the most critical one appears to be that of reinforced normal subjects with reinforced schizophrenic subjects. As revealed by the raw data all normal subjects showed an increase in the frequency of T-references, while three of the schizophrenic subjects showed no increase and hence, apparently, no conditioning. Another subject made only one T response increase and still another made only three more T responses. Therefore, for all practical purposes about half of the schizophrenics conditioned, whereas all of the normals conditioned. Even when the three schizophrenic subjects who made no T responses during their first story are omitted, along with their matched control, the difference between the groups is still significant at the .01 level.

There are several possible interpretations of this difference. Among these is the possibility of a positive relationship between the dependency needs of an individual and his conditionability, an interpretation which has received considerable support in recent experimental reports (Gerwitz and Baer, 1958). If the need for approval is considered a manifestation of dependency, the present data suggest that schizophrenics exhibit less dependency than normals when placed in a situation where approval is contingent on the behavior of the individual. The results of other investigators have partially supported the prediction of a positive

relationship between the dependency need of a person and his level of conditionability, but for a different reason. Cairns and Lewis (1962) found that while there was a difference in conditionability between persons who were considered highly dependent and those considered less dependent, the differences obtained were due "primarily to the sharp decrement in performance by the low dependent subjects rather than to evidence of conditioning" of those who were highly dependent. In the present study two schizophrenics showed a definite decrement in the frequency of criterion responses, but five showed some increase while all normals but one showed an increase in performance. Therefore, the difference found in the present study does not appear to be due to the same factors, i. e., decrement of performance for low dependent subjects rather than increment of highly dependent subjects, as the difference obtained by Cairns and Lewis.

Another possible explanation for the results is relevant to the concept of schizophrenics being individuals who have developed some immunity to social stimulation (Hartman, 1955). This at first glance appears to be similar to the need for approval suggested in the discussion of dependency needs. The difference lies in the way one thinks of schizophrenic behavior. If such behavior is thought of as being "independent," which is the implication of the above interpretation, an awareness and contact with reality is being attributed the schizophrenic which is not present in Hartman's

concept of them as having developed an immunity to social stimulation. The latter is more in line with traditional descriptions of schizophrenic behavior which generally include some reference to the schizophrenic's autistic "withdrawal from external realities back to the self" (Noyes, 1957, p. 369). One result of this is a serious disturbance in the affective life of the person possibly because affect has been withdrawn from matters of reality and is attached to other material which is unconscious. This suggests that the overt behavior of the schizophrenic is more determined by internal stimuli than external stimuli. This would imply that the results of this study might be explained in terms of a difference in the susceptibility of the two groups to external stimuli. If stimulation from the outside is not important to the schizophrenic, it could hardly be expected to reinforce their behavior to a significant degree. In his investigation, Hartman (1955) suggests "that schizophrenics are responsive to social stimulation but have very persistent habit patterns which make competing response patterns difficult to implement." If a response is already frequent in the schizophrenics total pattern of responses, it can be made more frequent by reinforcement, but if it is infrequent, it is not easily increased, according to Hartman. Two of the schizophrenic subjects in this study made a very high frequency of T responses during the first, non-reinforced story, but a very low number of T responses when such responses were reinforced. This is certainly a contradiction, but may be explained by the small number of subjects in this study or

possibly by referring to the results of Affleck (1954) who found that as time increased in an interpersonal task, the behavior of schizophrenics became more withdrawn.

As tentatively suggested in Chapter I, the results of this study have some implications for psychotherapy for persons diagnosed as schizophrenic. If conditionability can be considered a criterion for bringing about behavioral change, this study indicates that such techniques designed to teach new responses would not produce behavioral change in all schizophrenic persons. However, several individuals within the group appeared to condition. This suggests that though conditioning may not be possible with all schizophrenics, it may be a successful psychotherapeutic approach for some. If the extent to which an individual can be conditioned is any indication of his ability to enter into and profit by a therapeutic relationship, the present study supports the belief that it is extremely difficult to establish a psychotherapeutic relationship with persons diagnosed as schizophrenic.

The difference obtained between the two groups in this study might also be interpreted in terms of the experimenter. Marion (1956) has suggested that the reason he did not find a significant difference between reinforced and non-reinforced groups of normal subjects was the fact that some of the experimenters did not have a relatively high status in the eyes of the subjects. That is, the experimenter apparently did not have reward value for the

subjects. It might reasonably be speculated that a person not employed at the hospital and therefore having no actual authority could not be viewed as a person with status by a schizophrenic subject. Whereas, in a small college town a graduate student might be seen as having status, particularly by normal subjects who have just completed high school or one or two years of college.

No significant difference was obtained between non-reinforced normal and non-reinforced schizophrenic subjects. A glance at Appendix C which presents the per cent of the total responses for each category of responses, reveals, in fact, a rather interesting similarity between the two groups. This might possibly be explained by once again looking at the results of Affleck (1954) which indicates a positive relationship between time spent on interpersonal tasks and withdrawal behavior of psychotic subjects regardless of the education, age or chronicity of the condition. Since the non-reinforced story was told first, the schizophrenic would have spent less time in an interpersonal task and considered in the light of Affleck's findings would exhibit less withdrawal behavior. Also, on a "common sense" level it should be remembered that it is easier to talk in terms of one's self and one's own interpersonal environment than to talk in terms of a total stranger. This would be and apparently was true of normal as well as of schizophrenic subjects.

There was an increase in the frequency of criterion responses

during reinforcement of normals which was significant at the .01 level. This finding concurs with most research to date which has indicated that the rate of emitting a previously selected category of verbalizations can be altered by operant conditioning. One subject in this group showed a decrease in the percentage of T responses during the reinforced story although increasing in actual count. Closer examination of this subjects stories showed that in the first story the fifteen T responses were made during the first twenty-six phrases.. The total number of phrases in this story was thirty-eight. During the reinforced story the subject emitted twenty-four phrases before the first criterion response was made. Of the following thirty-four phrases, twenty-one were T responses. This suggests that even though conditioning was not as apparent, it occurred after the first critical response was made.

There was no significant difference in the number of criterion responses between the non-reinforced and reinforced stories of the schizophrenic subjects. None the less it is interesting to note that the variability in schizophrenics which is frequently reported was also obtained here. The difference between the variances of the normal and schizophrenic groups just missed being significant. Three of the ten hospitalized subjects made no reference to the examiner during the first story and for this reason might be omitted from the group. That is, a response

that has not been made cannot be reinforced or conditioned. But even if this is done, the difference between reinforced and non-reinforced schizophrenics still is not significant. Of these three subjects, two made no T responses during the second story this obviously could not be reinforced. One of these subjects was a male and the other was a female. It is possible that these subjects were unable to follow instructions; however, the male was able to follow instructions to the extent of including himself and two other persons. Behavioral observations suggest that this subject was embarrassed throughout the session perhaps because the experimenter was a female. If this were the case, it might also account for his inability to make any references to the examiner. The female subject who made no T responses during either story was unable to retain any type of story line or plot and involved so many persons in her story that it seems obvious that she could not follow instructions. Portions of her stories, in fact, resemble a word salad.

A third subject who made no T responses during the first story made fourteen T responses during the reinforced story. This was 46.66 per cent of the total phrases. The first story consisted primarily of references to herself and was, in essence, the story of how she happened to be at the hospital. Between the two stories this subject asked the experimenter a number of questions about her personal life and this afforded her the necessary material with

which to tell her second story. Her lack of reference to the experimenter during the first story might be due to her eagerness to have the experimenter know why she was at the hospital and resulted in the telling of "her story." Naturally, this did not include the experimenter. It might be argued, then, that this subject was some what different from the other subjects in having more information about the experimenter. There is, then, some doubt as to whether the increase in the T responses was actually conditioning.

The frequency of references to the experimenter during the second, reinforced story decreased for two schizophrenic subjects. The results of these two subjects were mentioned above and a possible explanation for this behavior was suggested.

One of the major difficulties in this research was in obtaining stories from subjects -- normals as well as from schizophrenics. Nearly every subject complained that the task was too difficult, that it required a capacity or creativity which they did not possess. Even if this was an attempt to rationalize possible failure, it did appear to influence the subjects' attitude. It is suggested that future research could be more easily accomplished and the data more quantifiable if one of the other verbal conditioning techniques (e.g., the use of cards on which there is several nouns and a verb to be used in constructing a sentence) were employed. This would seem to be particularly beneficial if the experimenter

is a stranger to the subject. This design, however, would take the experiment farther from a psychotherapeutic setting.

Though it was beyond the scope of the present study it would be interesting if future research could also determine the level of the subject's awareness of conditioning under similar conditions. Though the schizophrenic subjects were not asked, each of the normal subjects was asked, in the course of the conversation after the experiment, whether or not they knew what was occurring. None reported awareness of conditioning.

Another possibility for a follow-up would be to attempt to determine what differences exist between the schizophrenic subjects who condition and those who do not condition. Also, is there a correlation between conditionability of schizophrenics, using the present design, and success in therapy? Could the present conditioning technique be used as a prognosis-for-therapy test? Such questions must go unanswered pending further investigation.

Incidental observation of the behavior of individual schizophrenic subjects and their conditionability suggests that the more deviant their behavior the less conditionable the person. The schizophrenic subject who conditioned to the greatest degree mentioned that she had just recently had the customary meeting with the staff prior to her release and felt that it had been successful. Further research may develop a method of using susceptibility to conditioning as a determiner of mental stability.

CHAPTER VI

SUMMARY

This study was designed to determine some of the possible differences in normal and schizophrenic verbal behavior. The subjects were ten persons at the Larned State Hospital who had been diagnosed as schizophrenics and ten normal subjects residing in Hays, Kansas. The subjects were matched with regard to sex, age and education. The subjects task was to tell two stories of not less than two minutes in length, utilizing any plot desired, but including the subject, two other persons and the examiner. During the first story for both groups of subjects, the examiner remained silent and as motionless as possible. While the second story was told the subject was reinforced by the examiner for each reference made to the examiner. Reinforcement consisted of nodding the head, leaning forward in the chair, smiling or remarks such as "mmm-hm," "good" or a combination of these. The type of reinforcement was administered in a random order.

The stories were tape recorded and later transcribed to be presented in typed form to two judges who considered each phrase and determined to which of the following categories it pertained: the examiner, the subject, the environment or ambiguous. When the judges did not agree on a phrase, a third judge was asked to score it and the judgment of the two in agreement was used.

All possible differences between and within groups were

made and a binomial expansion used to determine the direction of differences in results. A Wilcoxon T was utilized to determine the magnitude of the differences. Significant differences were obtained between reinforced and non-reinforced normal subjects, and between reinforced schizophrenic and reinforced normal subjects. Differences obtained in comparing the following groups were not significant; reinforced and non-reinforced schizophrenic subjects, non-reinforced normal and non-reinforced schizophrenic subjects, reinforced normal and non-reinforced schizophrenic subjects and non-reinforced normal and reinforced schizophrenic subjects. As might be expected, schizophrenic subjects were somewhat more variable during the first story as compared to normal subjects.

The significant differences obtained indicate that there is a difference in the verbal behavior of normal subjects and those diagnosed as schizophrenic with normal subjects being more conditionable. These results were discussed in terms of possible implications for psychotherapy. That is, psychotherapeutic techniques designed to teach new responses through conditioning may not be applicable to all persons diagnosed as schizophrenic since half of the schizophrenic subjects did not condition. Included in suggestions for future research were the following: the possibility of determining what differences exist between schizophrenic subjects who did and those who did not condition,

determining whether or not there is a correlation between conditionability of schizophrenics and success in therapy and the possibility of using the present conditioning technique as a determiner of degree of deviant behavior.

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APPENDIX A

APPENDIX A

APPENDIX A

APPENDIX A

SCORING INSTRUCTIONS

The stories you are to score should include at least four characters. They are: the person telling the story whom we shall designate as (P), the examiner or person listening whom we shall designate as (T), and at least two other people whom we shall designate as (E). In addition, all people other than (P) and (T) and all things in the environment and situations other than those including (P) or (T) shall be designated as (E)

You are to score these stories, statement by statement to determine which numbered statements are about (P), (T), or (E). The following four scoring categories are to be used as the score which you will record on the score sheet which will be provided.

1. (T) When a statement includes any reference to the examiner (or listener) including him alone (T), or him in connection with the story teller (P, T), or (T, E) -- Score "T", i.e. any reference to the listener.
2. (P) When a statement includes any reference to the (P) alone or to (P, E) -- score "P", i.e., any phrase excluding the listener.
3. (E) When a statement does not include (P) or (T) -- Score "E", i.e., others in the story.
4. When a statement is unclear as to just who it includes it is ambiguous and is to be scored "A".

REMEMBER to score (T) if there is any reference to the listener and this includes any phrase or statement in which a personal pronoun referring to the listener is understood from the context of the phrase.

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WORKING TABLE

Sl. No.	Particulars	Debit	Credit	Sl. No.	Particulars	Debit	Credit
1.				26.			
2.				27.			
3.				28.			
4.				29.			
5.				30.			
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11.				36.			
12.				37.			
13.				38.			
14.				39.			
15.				40.			
16.				41.			
17.				42.			
18.				43.			
19.				44.			
20.				45.			
21.				46.			
22.				47.			
23.				48.			
24.				49.			
25.				50.			

APPENDIX B

Identification _____

Judge _____

SCORING SHEET

Phrase	T	P	E	A	Phrase	T	P	E	A	Phrase	T	P	E	A
1.	---	---	---	---	23.	---	---	---	---	45.	---	---	---	---
2.	---	---	---	---	24.	---	---	---	---	46.	---	---	---	---
3.	---	---	---	---	25.	---	---	---	---	47.	---	---	---	---
4.	---	---	---	---	26.	---	---	---	---	48.	---	---	---	---
5.	---	---	---	---	27.	cc	---	---	---	49.	---	---	---	---
6.	---	---	---	---	28.	---	---	---	---	50.	---	---	---	---
7.	---	---	---	---	29.	cc	---	---	---	51.	---	---	---	---
8.	---	---	---	---	30.	---	---	---	---	52.	---	---	---	---
9.	---	---	---	---	31.	---	---	---	---	53.	---	---	---	---
10.	---	---	---	---	32.	---	---	---	---	54.	---	---	---	---
11.	---	---	---	---	33.	---	---	---	---	55.	---	---	---	---
12.	---	---	---	---	34.	---	---	---	---	56.	---	---	---	---
13.	---	---	---	---	35.	---	---	---	---	57.	---	---	---	---
14.	---	---	---	---	36.	---	---	---	---	58.	---	---	---	---
15.	---	---	---	---	37.	---	---	---	---	59.	---	---	---	---
16.	---	---	---	---	38.	cc	---	---	---	60.	---	---	---	---
17.	---	---	---	---	39.	---	---	---	---	61.	---	---	---	---
18.	---	---	---	---	40.	---	---	---	---	62.	---	---	---	---
19.	---	---	---	---	41.	---	---	---	---	63.	---	---	---	---
20.	---	---	---	---	42.	---	---	---	---	64.	---	---	---	---
21.	---	---	---	---	43.	---	---	---	---	65.	---	---	---	---
22.	---	---	---	---	44.	---	---	---	---	66.	---	---	---	---

SCORING SHEET (Continued)

Phrase	T	P	E	A	Phrase	T	P	E	A	Phrase	T	P	E	A
67.	—	—	—	—	79.	—	—	—	—	91.	—	—	—	—
68.	—	—	—	—	80.	—	—	—	—	92.	—	—	—	—
69.	—	—	—	—	81.	—	—	—	—	93.	—	—	—	—
70.	—	—	—	—	82.	—	—	—	—	94.	—	—	—	—
71.	—	—	—	—	83.	—	—	—	—	95.	—	—	—	—
72.	—	—	—	—	84.	—	—	—	—	96.	—	—	—	—
73.	—	—	—	—	85.	—	—	—	—	97.	—	—	—	—
74.	—	—	—	—	86.	—	—	—	—	98.	—	—	—	—
75.	—	—	—	—	87.	—	—	—	—	99.	—	—	—	—
76.	—	—	—	—	88.	—	—	—	—	100.	—	—	—	—
77.	—	—	—	—	89.	—	—	—	—	101.	—	—	—	—
78.	—	—	—	—	90.	—	—	—	—	102.	—	—	—	—
Total	—	—	—	—	Total	—	—	—	—	Total	—	—	—	—

RAW DATA

Subject	Normal Subjects								Schizophrenic Subjects								
	T n	r	P n	r	n	E r	n	A r	n	T r	n	P r	n	E r	n	A r	n
1	1	22	21	4	6	9	7	14	24	2	4	13	0	29	1	16	
2	2	47	24	18	14	9	8	35	10	23	2	3	7	26	15	8	
3	7	25	21	17	28	9	14	12	0	14	78	12	29	1	22	3	
4	15	21	3	12	3	14	17	12	2	5	33	29	7	8	3	1	
5	1	45	23	3	2	6	2	6	0	0	19	91	41	41	33	10	
6	12	17	14	7	3	13	31	22	4	7	8	29	9	12	17	3	
7	8	27	22	8	2	22	8	8	17	3	2	28	2	5	2	0	
8	2	24	31	6	21	11	29	3	0	0	20	27	3	15	3	3	
9	7	17	5	3	4	2	18	6	4	16	7	3	3	18	29	14	
10	4	20	2	0	14	13	7	4	1	2	3	2	12	11	3	1	
Total	59	265	166	78	97	108	141	122	62	72	186	273	113	166	128	59	
Mean	5.9	26.5	16.6	7.8	9.7	10.8	14.1	12.2	6.2	7.2	18.6	27.3	11.3	16.6	12.8	5.9	
Medium	5.5	23.0	21.0	6.5	5.0	10.0	11.0	10.0	3.0	4.0	7.5	20.0	7.0	13.5	9.0	3.0	
Range	15	31	30	16	27	21	30	33	25	17	77	90	42	42	33	17	
SD _{est}	4.75	9.81	9.49	5.06	8.54	6.64	9.49	10.44	7.91	5.37	24.36	28.48	13.29	13.29	10.44	5.38	
		$SD_{est} = \frac{\text{Range}}{\sqrt{N}}$															