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# Verbal conditionability in schizophrenia as a function of behavioral characteristics of the subject.

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# VERBAL CONDITIONABILITY IN SCHIZOPHRENIA AS A FUNCTION OF BEHAVIORAL CHARACTERISTICS OF THE SUBJECT

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A Dissertation

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# INTRODUCTION

## Purpose

The question of whether schizophrenics verbally condition has met with conflicting experimental results. Most studies have found that schizophrenics did verbally condition (Buss, Gerjuoy and Zussman, 1956; Salzinger and Pisoni, 1958, 1964; Woodbury, 1960; Dinoff et al., 1960; Campbell, 1961; Vestre, 1962, 1965; Leventhal, 1962; Sommer et al., 1962; Timmons, 1962; Beech and Adler, 1963; Ullman, Krasner and Edinger, 1964; Johanssen and Campbell, 1964; Lapuc, 1967); in some studies, however, conditioning did not occur (Hartman, 1955; Cohen and Cohen, 1960; Ebner, 1965). It is clear that even in studies where conditioning was reported, not all subjects conditioned. Salzinger and Pisoni (1958, 1964), Leventhal (1962) and Vestre (1962, 1965) are quite explicit with regard to this, and the two latter researchers present actual percentages of their samples that did condition (between forty and fifty per cent). Thus, both pooling across and within studies, results indicate that there are schizophrenics who do verbally condition, and those who do not.

Very little theoretical or experimental attention has been directed toward the question of why some schizophrenics do condition, and others do not. It appears that research

in this area would be well served by the delineation of characteristics of and differences between differential responders to verbal conditioning in schizophrenia. This latter has also received little attention, especially with regard to the elucidation of more comprehensive and global behavioral and personality characteristics of conditioners and nonconditioners. Krasner's (1958) question, "what are the personality correlates of being (verbally) conditionable" is still largely unanswered with reference to schizophrenics.

One important source of data about the schizophrenic are his overt ward behaviors, which are a large part of his total behavioral repertoire. These behaviors can provide comprehensive, detailed and objective data about the schizophrenic and how he behaves in his environment. The purpose of this study, then, is to ascertain the relationship between overt ward behaviors and verbal conditionability in order to make explicit behavioral characteristics of schizophrenics who do and do not verbally condition.

## Review of the Literature on Characteristics of Verbal Conditioners

Leventhal (1962) reported that acute schizophrenics conditioned whereas chronic schizophrenics did not. Leventhal, however, as did the experimenters in the three other studies in which schizophrenics did not condition (Hartman, 1955; Cohen and Cohen, 1960; Ebner, 1965), arbitrarily chose

the pronouns to be reinforced before the experimental trials began. This procedure, discussed in detail below (see Method, p. 22), is inadequate since it may obscure conditioning in subjects who would condition using a slightly different procedure, rendering Leventhal's results suspect. Further arguing against Leventhal's conclusions are the findings of several studies that chronic schizophrenic patients did verbally condition (Vestre, 1962; Johanssen and Campbell, 1964; Ullman, Krasner and Edinger, 1964). Schizophrenic subtype, i.e., paranoid-nonparanoid, was also found not to differentiate schizophrenic groups (Hagen, 1960; Johanssen and Campbell, 1964).

High anxiety was found to correlate positively with conditioning, according to Taffel (1955). His population, however, consisted of schizophrenics, other psychotics and neurotics, making it thus impossible to apply his findings to an exclusively schizophrenic population. Furthermore, Buss and Gerjuoy (1958), Ebner (1965) and Doherty (1966), each using only schizophrenics, found no relationship between anxiety and verbal conditioning, which agrees with results found for normals (Rogers, 1960; Matarazzo, et al., 1960).

There has been little previous investigation of more global personality and behavioral parameters of verbal conditioning. The two studies related to this problem are those of Vestre (1962) and Johanssen and Campbell (1964).

Vestre (1962) compared the scores on the Edwards Personal Preference Inventory of schizophrenics who did and did not condition and found that conditioners scored significantly higher on need (n) Deference, n Affiliation, n Abasement, n Orderliness and significantly lower on n Achievement, n Autonomy and n Dominance. Vestre's findings, however, are of questionable applicability to schizophrenics since they are need scores on a test principally developed for and standardized upon normals. Sarason (1958) found that his normals who conditioned were more compliant and dependent than those who did not, which seems to bear some resemblance to Vestre's conditioners who were higher on n Deference, n Affiliation, n Abasement and lower on n Autonomy and n Dominance. Eysenck (1959) found that neurotics who conditioned were significantly higher on introversion as measured by the Maudsley Personality Inventory. Introversion seems related to characteristics reported by Vestre, such as high n Deference and perhaps high n Affiliation. On the other hand, Beech and Adler (1963) found that schizophrenic subjects who conditioned were not higher on introversion, as measured by the Maudsley Inventory, than those who did not. It may be, however, that the Maudsley Personality Inventory was an inadequate instrument for the measurement of introversion in schizophrenia.

Johanssen and Campbell (1964) divided their subjects into "socially responsive" and "socially nonresponsive"

groups and found that the "socially responsive" group showed a trend, which almost reached significance, toward conditioning better than the "socially nonresponsive" group. These results, however, can be criticized on methodological grounds. "Social responsiveness" was determined by numerical ratings on four scales: outgoingness, friendliness, alertness to the environment, and isolation. Ratings were made by aides who had known the patients for months and several of the rating scale terms were very subjective. Rater bias was not controlled for and rating was done in a very crude manner. It is thus difficult to know precisely what "socially responsive" means. It may well mean "liked by the aides," or, operationally, "spends more time with the staff." It could essentially mean "more verbal," but there is no unambiguous way of directly knowing this from Johanssen and Campbell's report. Furthermore, they chose in advance the pronouns to be reinforced, which, as will be discussed more fully below, may cover up conditioning in some schizophrenics who would condition under better procedures. It should also be pointed out that Johanssen and Campbell's study was done with women, and, as Buss and Lang (1965) and Schooler (1963) have observed after a review of studies giving identical tasks to male and female schizophrenics, relationships that hold true for males do not always hold true for females and vice versa. In general,

experimental findings with one sex cannot be generalized to explain the behaviors of the other sex (Schooler, 1963).

Despite methodological flaws, Johanssen and Campbell's findings seem to possess at least partial validity in that they mirror mainstream findings on psychological deficit in schizophrenia. This position, in brief, is that performance on most, if not all, psychological tasks is worsened by psychopathology and the more severe the psychopathology, the more impaired the performance. Therefore, it is expected that schizophrenics will perform less effectively than any other functional psychiatric group, and that more severely ill schizophrenics will do worse than their less severely ill counterparts. As Farina (1969) has observed:

> A very large number of studies demonstrate that schizophrenic patients display psychological deficits (Buss and Lang, 1965) defined as inadequacies in the behavior of such patients in comparison to controls (usually normals but also other psychiatric groups) or in relation to expectations based upon education and intelligence. Usually measured in terms of performance on laboratory tasks, these deficits are reported with such regularity that they would appear to be one of the more demonstrable and stable characteristics of people labeled as schizophrenics.

With regard to degree of psychopathology in schizophrenia, the process-reactive and good premorbid-poor premorbid studies (see Herron, 1962; Schlechta, et al., 1965) have been taken by supporters of these dichotomies to indicate that the less severely ill (reactive or good premorbid) schizophrenics, however defined, perform better than more

severely ill (process or poor premorbid) schizophrenics.

In that "social responsiveness" is conventionally valued to indicate less psychopathology than "social non-responsiveness," Johanssen and Campbell's findings might seem expectable given the assumptions of researchers such as Farina (1969), Herron (1962) and Schlechta, et al. (1965). Thus, returning to verbal conditioning of the schizophrenic, one of the significant parameters of conditioning might be the degree of psychopathology.

There is, however, a good deal of evidence that schizophrenics do not always perform worse than normals, and that more severely ill schizophrenics, however defined, do not always perform worse than less severely ill schizophrenics. These findings also apply to conditioning, as noted by Spence and Taylor (1954, 1959), Home (1952) and Franks (1948), all of whom found no difference between schizophrenics and normals on a variety of types of classical conditioning. The same results were found on a variety of operant conditioning tasks (Peters and Murphree, 1954; King and Lovinger, 1957; O'Conner and Rawnsley, 1962; Beech and Adler, 1963; Knopf and Brown, 1967; Crumpton and Mutalipassi, 1969). Comparing more and less disturbed schizophrenic groups on an operant motor task, Crumpton and Mutalipassi (1969) found that the more disturbed group improved more and outperformed the less disturbed group following positive reinforcement.

It can be seen from these studies that the assumption that the greater the psychopathology the worse the performance on psychological tasks is an unwarranted overgeneralization. King and Lovinger (1957) state that the hypothesis that severity of neuropsychiatric illness is inversely related to rewarded operant rate is untenable in light of their data and that "operant motor behavior seems best classified as a peripheral variable in terms of psychopathology."

The face validity behind Johanssen and Campbell's findings rests on the assumption that nonconditioners would be expected to manifest more psychopathology than conditioners. As this assumption is unproved and questionable, the face validity is lessened. The need for more accurate and specific within-subject parameters of verbal conditioning remains.

## Overt Ward Behavior and Verbal Conditioning

A review of the literature on the verbal conditioning of the schizophrenic reveals that criteria for differentiating conditioners and nonconditioners have tended towards narrowness or subjectivity. More objective and comprehensive criteria for differentiating schizophrenics who do and do not condition are called for. It is felt that overt ward behaviors may be one possible differentiator and consequently should be investigated. These behaviors are a large part of a schizophrenic's total behavioral repertoire,

and observation of the schizophrenic in his environment reveals directly much information that would have to be derived through inference from tests, inventories, etc. Ward behavior reflects heavily the type of adaptation the patient makes to his environment in general and also to specific parts of it, i.e., other patients, staff, environmental objects and resources. Moreover, overt behaviors, being highly objective, provide data from which more scientific inferences about subject characteristics may be drawn (i.e., whether conditioners tend to be introversive or extroversive, social or non-social, verbal or non-verbal, bizarre or not, hostile or not, etc.). This study, then, will ask in what ways the behaviors of schizophrenics who do condition differ from those who do not.

## Observation and Recording of Ward Behavior

A need has existed for the development of viable techniques for the objective observation and recording of the ward behavior of hospitalized psychiatric patients. Several have been devised over the last thirty years. A full review of these techniques can be found in Harmatz, Glassman and Mendelsohn (1969), and Mendelsohn (1969). Only a brief review is necessary here for the purposes of this study.

Jones (1941) observed and recorded bodily movements using nine categories, each representing a part of the body.

He used a time sampling method consisting of twenty five minute randomly chosen observation periods per patient. Very high interobserver reliability in the scoring of movements according to his categories was found.

Hunter, Schooler and Spohn (1962) recorded the posture of the patient, his location in the ward and his behavior according to five broad categories: "no-behavior," "social activity," "parasocial activity," "functional, non-social activity," and "non-functional activity." Subjects were observed for up to ten seconds per observation period, of which there were over one hundred.

Lovaas, Freitag, Gold and Kassorla (1965), working with children, used a technique which is closest to the technique employed in the present study. In order to maximize observer attention and accurately measure frequency and duration of behaviors, Lovaas, et al. developed an apparatus consisting of an Esterline-Angus pen recorded and an operating panel. They also formulated a system of behavior categories, consisting of verbal, social and non-social behaviors. Interobserver reliability was found to be very high.

The present observational and recording technique, the Behavioral Observation System, was developed by Harmatz, Glassman and Mendelsohn (1969) and has been described fully elsewhere (Harmatz, et al., 1969; Mendelsohn, 1969). Briefly, the system consists of an Esterline-Angus pen

recorder and an operating panel as per Lovaas, et al., and a behavioral classification system adapted to the ward behavior of the hospitalized male psychiatric patient. It makes use of twelve behavior categories, which have been found to comprehensively and objectively describe all of the patient's ward behavior. The twelve categories are: Non-Involved, Self-Stimulatory, Verbal I (with fellow patients), Verbal II (with staff and any other nonpatients), Non-Verbal Interpersonal, Active Entertainment, Passive Entertainment, Bizarre, Atavistic, Pacing, Obtaining Physical Reinforcement and Non-Classificatory. An extensive study (Harmatz, et al., 1969) revealed that less than one per cent of over one hundred hours of observation of schizophrenics' behavior was subsumed under the Non-Classificatory category, suggesting that the other eleven categories account for nearly all of the schizophrenics' overt ward behavior. Each behavior category is represented by a button on the operating panel of the Esterline recorder, enabling the precise measurement of both frequency and duration of the behavior. Since the buttons can be depressed simultaneously, multiple behavior can be accurately recorded. Interobserver reliability across both individuals and behavior categories was found to be extremely high, r's ranging from .94 to .99. Consistency within subjects for each behavior category was also found to be high, r's ranging from .48 to .96, most being above .70. The ten-minute time sampling interval used

was found to yield an accurate picture of behavior seen in larger observational segments. Besides its apparent face validity, the Behavioral Observation System has already received a measure of construct validity from the study by Mendelsohn (1969) in which it differentiated long-term and short-term schizophrenic patients in predicted directions.

## Verbal Conditionability, Overall Conditionability and Hospitalization

The effects of hospitalization on patient behaviors has been discussed by many researchers. Hospitalization has been labeled a potent conditioning force, one of those main effects is the depression of certain types of patient behaviors, notably "Functional" (behaviors using ward facilities and objects which keep one "functional" (Hunter, Schooler and Spohn, 1962) on the ward, such as card playing, reading, television watching) and social behaviors (Meyerson, 1939; Goffman, 1961; Schooler and Parkel, 1962; Hunter, et al., 1962; Ullman and Krasner, 1965; Mendelsohn, 1969). In perhaps the most adequately controlled study of the effects of hospitalization on patient behavior over time, Mendelsohn (1969) found that long-term schizophrenic patients exhibited significantly less Social and Functional behaviors than short-term schizophrenic patients. With Social and Functional behavior suppressed, if not extinguished, behavioral deficits would be expected in long-term

schizophrenics (Mendelsohn, ibid.; Ferster, 1961), and therefore it is not surprising that long-term schizophrenics exhibited significantly more "Null" behaviors (behaviors devoid of interaction with other people or objects) and inappropriate, "Pathological" behaviors (Mendelsohn, ibid.).

In line with the above theorization and research, if hospitalization is a powerful conditioning force which brings about the depression of Social and Functional behavior and the increase of Null and Pathological behavior, some inferences about patient characteristics can be drawn. It would seem that there are many patients, especially those whose behaviors fit the depressed behavior profile, who are highly conditionable in that their behavior has been changed and/or is maintained by hospital-related stimuli. Goldman (1968) found that the most successful adjustment outside the hospital by discharged psychiatric patients was found among those who rejected their identity as patients and who most resisted control by the staff in the hospital. This again suggests that there are differences in conditionability of patients and that conditionability may be an important factor in a patient's responses, behavioral and otherwise, to hospitalization.

Returning to the question of characteristics of schizophrenics who do or do not verbally condition, it is suggested that verbal conditionability may well be correlated with overall conditionability. This position acquires

some support from the previously cited findings of Vestre (1962) and Sarason (1957). Their subjects who conditioned were found to be compliant, dependent, low in needs for autonomy and dominance. These traits and test findings seem to suggest high overall conditionability. If the suggested relationship between verbal and overall conditionability is true, and given that hospitalization is a powerful conditioning force, it seems reasonable to expect that many characteristics of schizophrenics who verbally condition will resemble characteristics of schizophrenic patients who have shown high conditionability to the hospital.

The verbal conditioning procedure used in this study will be that of Taffel (1955) as opposed to free-verbalization procedures as used by Greenspoon (1955) and others. The Taffel method will be used since it is felt that the operant verbal rates of some and perhaps many schizophrenics, particularly chronics, might be too low for conditioning in the less structured free-verbalization situations. The more structured Taffel task, where the E requests simple sentences (and may repeat this request) seems better suited to these low verbal schizophrenics. Although this study will refer to characteristics of schizophrenics who verbally condition, this must be taken to mean "verbally condition on the Taffel procedure" until confirmatory research is done using free-verbalization procedures, since results and implications of findings on one procedure may not always generalize to the other.

## Problem

There is evidence that some schizophrenics verbally condition whereas others do not. It is consequently felt that the elucidation of characteristics of those who do and do not condition is of importance. It has been suggested that one important aspect of a patient's total behavior is his overt ward behavior and that this behavior provides comprehensive and objective criteria upon which to base inferences about patient characteristics. A new technique for the observation and recording of ward behavior of the hospitalized schizophrenic patient has been described. A hypothesized relationship has been drawn between verbal and overall conditionability, the inference being that schizophrenics who verbally condition will show evidence of high overall conditionability. Given the potency of hospitalization as a conditioning force, it would be expected that highly conditionable schizophrenics would show marked hospitalization effects. The theoretical and behavioral implications of high conditioning effects of the hospital on schizophrenic ward behavior can be described as a depressed behavior profile. It is thus hypothesized that schizophrenics who verbally condition will show a depressed behavior profile and this leads to three specific hypotheses.

## Hypotheses

I. Social behaviors. The highly depressing effect of hospitalization on Social behaviors has been postulated (Meyerson, 1939; Goffman, 1954; Ullman and Krasner, 1965) and shown (Mendelsohn, 1969). Harmatz, Glassman and Mendelsohn (1969) found that the sixty-four schizophrenics they observed spent, on the average, only eight per cent of their time engaged in Social behaviors. In light of the overall hypothesis it would be expected that highly conditionable schizophrenics would show the depressed effect even more, and therefore it is hypothesized that schizophrenics who do verbally condition will show less Social behaviors than those who do not, or, in other words, that high levels of Social behaviors will be negatively correlated with verbal conditioning.

II. Functional behaviors. The same depressing effect of hospitalization upon "Functional" behaviors (Active and Passive Entertainment in the Behavior Observation System) as upon social behaviors has been postulated (Hunter, et al., 1962) and shown (Mendelsohn, 1969). Glassman (1969) found that patients rated high on likeability and manageability by nurses exhibited less Active Entertainment behaviors than low rated patients.

Elstein and Van Pelt (1960) also found that the nursing staff liked less active patients. Patients compliant to the staff would especially be expected to show depressed amounts of "Functional" behaviors. It is therefore hypothesized that schizophrenics who do verbally condition will show less "Functional" behaviors than those who do not, or, in other words, that high levels of "Functional" behaviors will be negatively correlated with verbal conditioning.

III. Null behaviors. Given the suppression and/or extinction of Social and Functional behaviors, and the unstimulating environment of the ward, behavior deficits would seem likely to occur (Mendelsohn, 1969). One likely result of this would be increases of behavior with no apparent interactions with individuals or objects in the environment, behaviors here labeled as "Null" behaviors and which consist of non-involved and self-stimulatory behaviors. Goffman (1954), Ullman and Krasner (1965) and others have pointed out that staff, who are important reinforcers, prefer low levels of ward activity. Glassman (1969) found that patients rated as high on likeability by nurses exhibited significantly more Null behaviors than low rated patients. Again

compliant and conditionable patients would be expected to move in the direction of increased nonactivity. Therefore, it is hypothesized that schizophrenics who verbally condition will show more Null behaviors than those who do not; in other words, Null behaviors will be positively correlated with verbal conditioning.

There is another important class of behaviors, "Pathological" behaviors (bizarre, atavistic, destructive), for which no relationship with verbal conditionability is hypothesized. This is because Pathological behaviors could be expected in both highly conditionable patients whose behavior deficits have been filled in with inappropriate Pathological behaviors (Mendelsohn, 1969) or in low conditionable patients strongly trying to resist the influence of the hospital (Goffman, 1961). Since staff generally devalue Pathological behavior, in many cases (particularly when the patient manifests other active behaviors) its continuance can be seen as an indication of low conditionability. Thus there seem reasons why both high and low conditionable schizophrenics could exhibit Pathological behaviors, which would make a consistent relationship between Pathological behaviors and verbal conditionability unlikely.

# METHOD

## Subjects

The subjects were forty hospitalized male schizophrenics randomly selected from the entire roster of a closed ward of Manhattan State Hospital in New York. All Ss carried a schizophrenic diagnosis and were free of known organic pathology. Ages ranged from 21 to 61. This information was taken from each S's clinical folder.

## Apparatus

(1) Verbal conditioning materials. The verbal conditioning materials followed those of Taffel (1955). This consisted of 80 3x5 cards. Upon each card was printed a common verb in the past tense on top and 6 pronouns--I, WE, HE, SHE, YOU, THEY--underneath. The order of the pronouns on each card was random. Appendix I presents a sample card.

(2) Behavior recording apparatus (the Behavior Observation System). The apparatus for observing and recording patient ward behavior was an Esterline-Angus twenty-pen recorder and an operating panel which contained twelve buttons. Each button was connected to an electric switch which was attached to a corresponding pen on the Esterline recorder, so that the pen was deflected for as long as the button was depressed. Any number of buttons could be pressed simultaneously and the corresponding number of pens would deflect.

A behavior category was assigned to each button, enabling accurate measurement of the frequency and duration of each behavior occurring.

Behavior Categories. Previous research with the Behavior Observation System (Harmatz, Glassman and Mendelsohn, 1968) indicated twelve behavior categories which most comprehensively include and accurately describe ward behaviors of male psychiatric patients. These are:

Pacing - defined as non-goal oriented walking activity.

Non-involvement - behavior devoid of observable overt interaction with any person or object in the environment. Examples are sleeping or staring at the walls or floor.

Self-Stimulatory - a broad category consisting of any self-induced repetitive behavior which appeared to be stimulating to the individual, such as fondling or scratching oneself.

Verbal I - any nonrepetitive, intelligible verbal behavior between a patient and any other patient.

Verbal II - same as Verbal I, except between a patient and any member of the staff or visitors.

Non-Verbal Interpersonal - a broad category consisting of "socially acceptable" nonverbal activity between a patient and anyone else. Examples are lighting another's cigarette or walking with another in silence.

Bizarre - behaviors which the observer judged to be unusual

or odd in the situation, such as gesturing, laughing or talking to oneself.

Atavistic - behaviors destructive or annoying to oneself or others, such as shouting, throwing objects, striking another.

Active Entertainment - any entertainment-seeking behavior which demands marked physical activity, such as pool or card playing.

Passive Entertainment - entertainment-seeking behavior which demands minimal physical activity, such as reading a book or watching television.

Reinforcement - seeking physical reinforcement, such as going to the water fountain and drinking, going to the candy or coffee machines and eating or drinking.

Non-Classificatory - defined as any observable behavior which can not be subsumed under any of the above eleven categories.

Behavioral Classes. Previous research (Mendelsohn, 1969) has indicated the relevance of subsuming the individual categories into four general behavioral classes which are based on the work of Hunter, et al. (1962). These are:

"Null" Behaviors - Non-Involvement, Self-Stimulatory.

"Pathological" Behaviors - Bizarre, Atavistic.

"Social" Behaviors - Verbal I, Verbal II, Non-Verbal Interpersonal.

"Functional" Behaviors - Active Entertainment, Passive Entertainment.

## Procedures

Instructions for the administration of the Taffel cards were those of Taffel (1965):

> When I turn these cards over you will see a word in the center of each card. I want you to make up a sentence using this word. Below the word in the center you will see a group of other words. Take any one of these and use it to start your sentence (Pause). Now it does not matter whether the sentence you make up is long or short, or even if it is complicated or simple. It is important that you answer with the first sentence that comes into your mind. It isn't easy to do this but you will find that if you try to answer as quickly as possible you are more likely to give the first thing that comes into your mind. Any questions?

Each S was given all of the eighty cards in random order. The first twenty trials were given without reinforcement in order to establish an operant level of responding. The E kept a record of the frequency of usage of each pronoun and selected two pronouns of moderate usage to reinforce for trials 21 to 80. Selecting pronouns of moderate usage (as close to chance levels as possible, which would be 7 out of 20 for two pronouns combined and 3 or 4 for each pronoun) and establishing an operant level are important modifications of Taffel's original procedures (see Vestre, 1962, 1965). Taffel himself and many following him arbitrarily selected the pronouns to be reinforced (usually I and WE) before any trials had begun. If, using this procedure, one or both of these pronouns were of very low usage in the S's repertoire (i.e., would occur less than 4 times for the

2 pronouns, or less than 2 for one pronoun during the first 20 trials), reinforcements might be too rare to be effective and, in Hullian terms, habit strength too weak to be modified to any marked degree by reinforcement. If the pronouns were of high usage (i.e., 12 or more for the last 2 pronouns, or 7 or more for any one pronoun) there is a "ceiling" on responding since high percentage increases become impossible. Moreover, the use of high usage pronouns in the subject's repertoire would create a high rate of continuing reinforcement from the outset so that it would be less difficult for the subject to recognize the reinforcement contingencies. Some of these disadvantages (of not deriving an operant level and using high or low usage pronouns) have been pointed out by Vestre (1962, 1965) and Hartman (1955). Hartman initially selected the pronouns to be reinforced in advance and obtained no conditioning effect for his group of subjects. Upon reviewing the data, it was found that his subjects were conditioned when reinforced for either high or medium level pronouns, but not for low.

Reinforcement (reward) was given by means of Mn-hmn, good, uh-huh or nods for sentences using the pronouns selected after the operant period. The E made no response when the S began a sentence with any of the other pronouns. A variety of rewards was used to minimize the cueing effect of any one reward. The use of reward-no response has been shown to be as effective as punishment-no response and reward-punishment (Spence, 1956).

Awareness. Despite the claims of some that there is no verbal conditioning without awareness of the reinforcement contingencies (Spiegelberg, 1958; Levin, 1961), the evidence from other studies with schizophrenics indicates otherwise. The percentage of subjects aware of the reinforcement contingencies, as reported in the literature, range from 2 to 20 per cent, with the majority falling under 10 per cent. Levin claims that more intensive questioning would reveal awareness, and administers a very specific 16-item questionnaire which all but reveals the response contingencies right in it and makes it fairly easy for the S to learn the contingencies during the questioning, as Greenspoon (1962) has pointed out. Lanyon (1964) has found that awareness correlates highly with intelligence as measured by the WAIS. As one of the characteristics of schizophrenics seems to be a decline in intelligence, as measured on the WAIS and other instruments, and especially of abstract capacities, it might be expected that schizophrenics would become aware less frequently than normals. In this study, awareness was tested for by the following questions:

(1) Did anything I do or say influence you in any way?

(2) Which pronoun did you use most often?

(3) Why?

These questions are from Beech and Adler (1963), the study

which reported the highest percentage of aware subjects.

Behavioral Observations. Behavioral observations were made on a closed ward of the Manhattan State Hospital. The ward appeared to be typical of many hospital wards. It was a large room, approximately 60 x 30 feet, containing many chairs, a television set, a pool table, several smaller tables on which card games were often played, and a coffee machine. Each of the 40 Ss was observed for ten 10-minute intervals extending over a 2-week period. Previous research with the Behavior Observation System (Harmatz, et al., 1969) has revealed that a 10-minute observation interval yields an accurate picture of larger time segments of patient ward behavior. Interobserver reliability for observations using the 12 behavior categories was also found to be high (ibid.). The observations were randomized for days of the week and hours of the day with one restriction: 5 were in the morning and 5 in the afternoon. When an S's observation time was due, the E sat on the ward in a central location where he could have an unobstructed view of patient activity and recorded all of the S's behavior by pressing the appropriate button or number of buttons (each button representing a behavior category) on the operating panel of the Esterline-Angus recorder as described above. The operating panel was on the E's lap and the Esterline recorder itself was placed under his chair, both being out of a patient's vision unless he was very close to the E. Questions concerning the

apparatus and what the E was doing were answered by the E referring to his explanation to the entire ward before beginning observations that he was keeping track of activities on the ward. Patient comments and questions generally quickly dropped off. To avoid experimenter bias, the verbal conditioning and behavioral observations were done by different experimenters, and the E making the behavioral observations had no knowledge of the S's performance on the verbal conditioning task.

# RESULTS

For each S, two types of data were gathered: verbal conditioning scores and overt ward behavior measurements. Verbal conditioning was assessed by comparing the number of reinforced pronouns emitted during trials 61-80 (criterion level) with the operant level of those pronouns (frequency emitted during trials 1-20 when no reinforcements were given). Eighteen Ss showed increases in operant rate, the probability of which was significant at or beyond the .05 level. This was determined by use of the expansion of the binomial table (Biometrika, I, 1968), which enabled the determination, for each S, of the probability of occurrence of his criterion rate given his operant rate. For this group, called "conditioners," the mean number of pronouns used was 6.2 for the operant period, 10.9 for the criterion period. Sixteen Ss showed no significant differences between the number of pronouns used during the operant and criterion periods. For this latter group, called "non-conditioners," the mean number of pronouns used was 6.7 for the operant period, 6.1 for the criterion period. A third group of 6 Ss showed decrements in operant rate significant at or beyond the .05 level. Decrements ranged from 50 per cent to 80 per cent. For this group, called "negative conditioners," the mean operant rate was 6.5, the mean criterion rate, 2.5. An analysis of variance revealed no

significant differences between the operant levels of the 3 groups. A chi-square test revealed no differences in the paranoid-nonparanoid ratios of the groups. Two Ss indicated awareness of the pronoun reinforcement contingencies, and were consequently disqualified.

## Behavior Class Data

The 3 hypotheses of this study predicted that schizophrenics who verbally conditioned would perform more Null behaviors and less Social and Functional behaviors than schizophrenics who did not condition. The 3 measurements of ward behavior, derived from 10 observations for each S, were the total amount of time spent per behavior, the frequency (the number of times a subject performed the behavior) and the average time per behavior; this latter measure was derived for each S by dividing his total time spent engaged in a given behavior by his total emitted frequency of that behavior. Figures 1, 2, and 3 are graphs of the mean scores for the conditioning, nonconditioning and negative conditioning groups on each of the 4 Behavior Classes, using the 3 measurements of ward behavior just described. It can be seen that there are consistent differences in the means of the 3 groups for the Null, Social and Functional Behavior Class data. With regard to the Social and Functional Behavior Class data, the means for the nonconditioners and negative conditioners, as predicted, are larger than the

means for the conditioners. For the Null behavior data, also as predicted, the means for the conditioners are larger than those of the nonconditioners and negative conditioners. Means for the 3 groups on Pathological behaviors, again as predicted, differ very slightly. Comparisons of the means of the 3 groups on each of the Behavior Classes were done by means of analyses of variance, the results of which are presented in Tables 1-17.

With regard to Hypothesis I, which predicted that conditioners would show less Social behavior than nonconditioners and negative conditioners, Table 1 presents the means and standard deviations for Social behavior using time, frequency and average time per behavior data for the conditioning, nonconditioning and negative conditioning groups. An examination of Table 2 reveals that there were significant differences between the 3 groups for total time spent engaged in Social behaviors ($F = 5.76$, $df = 2/37$, $p < .005$). A Scheffé Test for Multiple Comparisons (Guenther, 1965) performed on these data indicates that conditioners spent significantly less time performing Null behaviors than nonconditioners, negative conditioners and both latter groups combined. All multiple group comparisons referred to below were also done by means of the Scheffé test, the results of which are summarized in Table 3. Comparisons of the nonconditioners and negative conditioners are omitted since there were no significant differences between these

two groups on any of the measurements of any of the Behavior Classes. Inspection of Table 4 reveals that there were significant differences between the frequency data of the 3 groups for Social behaviors ($F = 5.59$, $df = 2/37$, $p < .005$), conditioners having emitted a significantly smaller frequency of Social behaviors than nonconditioners, netagive conditioners and these two latter groups combined. From Table 5 it can be observed that there were significant differences between the average time per behavior data of the 3 groups ($F = 9.31$, $df = 2/37$, $p < .001$), conditioners having performed significantly less average time per Social behavior than either of the two other groups, or the two other groups combined.

Concerning Hypothesis II, which predicted that conditioners would show less Functional behavior than nonconditioners and negative conditioners, Table 6 presents the means and standard deviations for Functional behaviors using time, frequency and average time per behavior data for the 3 groups. An examination of Table 7 reveals that the 3 groups significantly differed on total time spent performing Functional behaviors ($F = 3.47$, $df = 2/37$, $p < .025$), conditioners having spent less total time engaged in Functional behaviors than either nonconditioners or nonconditioners and negative conditioners combined. Conditioners also showed a trend, which almost reached significance, towards spending less time engaged in Functional behaviors than negative

conditioners. Inspection of Table 8 shows that there were significant differences between the Frequency data of the 3 groups ($F = 3.50$, $df = 2/37$, $p < .025$), conditioners having performed Functional behaviors significantly less frequently than nonconditioners, negative conditioners and these two latter groups combined. From Table 9 it can be seen that there were no significant differences between the 3 groups for average time per Functional behavior ($F = 1.62$, $df = 2/37$).

With regard to Hypothesis III, which predicted that conditioners would show more Null behaviors than nonconditioners and negative conditioners, Table 10 presents the means and standard deviations for Null behaviors using time, frequency and average time per behavior data for the 3 groups. Inspection of Table 11 reveals significant differences between the 3 groups for total time spent engaged in Null behaviors ($F = 3.62$, $df = 2/37$, $p < .025$), conditioners having spent significantly more time performing Null behaviors than nonconditioners, negative conditioners or both latter groups combined. An examination of Table 12 reveals that there were no significant differences between the frequency data of the 3 groups for Null behaviors ($F = 1.49$, $df = 2/37$). Observation of Table 13 indicates that the 3 groups significantly differed with regard to the average time per behavior data ($F = 3.49$, $df = 2/37$, $p < .025$), conditioners having spent more average time per Null

behavior than nonconditioners, negative conditioners or both combined.

The 3 groups were also compared on Pathological behaviors. No behavioral differences were predicted. Table 14 presents the means and standard deviations for the time, frequency and average time per behavior data. An examination of Tables 15-17 reveals no significant differences between the 3 groups on any of the 3 measures of Pathological behaviors (time data: $F = .48$, $df = 2/37$; frequency data: $F = .05$, $df = 2/37$; average time per behavior data: $F = .52$, $df = 2/37$).

## Behavior Category Data

The behaviors on the 12 Behavior Categories were also compared for more specific behavioral differentiations between the groups. Since no significant differences were obtained on any Behavior Category between the nonconditioners and negative conditioners, only the Behavior Category data of conditioners compared with nonconditioners, and conditioners compared with negative conditioners is presented. Data is again stated in terms of time, frequency and average time per behavior, and is drawn from sums of the 10 observations for each S. Although no specific predictions were made for behavioral differences between the groups on any of the Behavior Categories, it was hoped that one or more of the Behavior Categories within the Null, Social and Functional

Behavior Classes might also differentiate the groups in the same predicted directions that were made for the Behavior Class data. An examination of Tables 18-23 reveals that the groups did significantly differ on the Non-Involved, Verbal I (with patients), Verbal II (with staff), and Active Entertainment categories. The differences in each case were in the predicted direction for the Behavior Class to which the category belonged. Non-Involved behaviors were components of the Null Behavior Class; Verbal I and II behaviors were components of the Social Behavior Class, and Active Entertainment behaviors were components of the Functional Behavior Class.

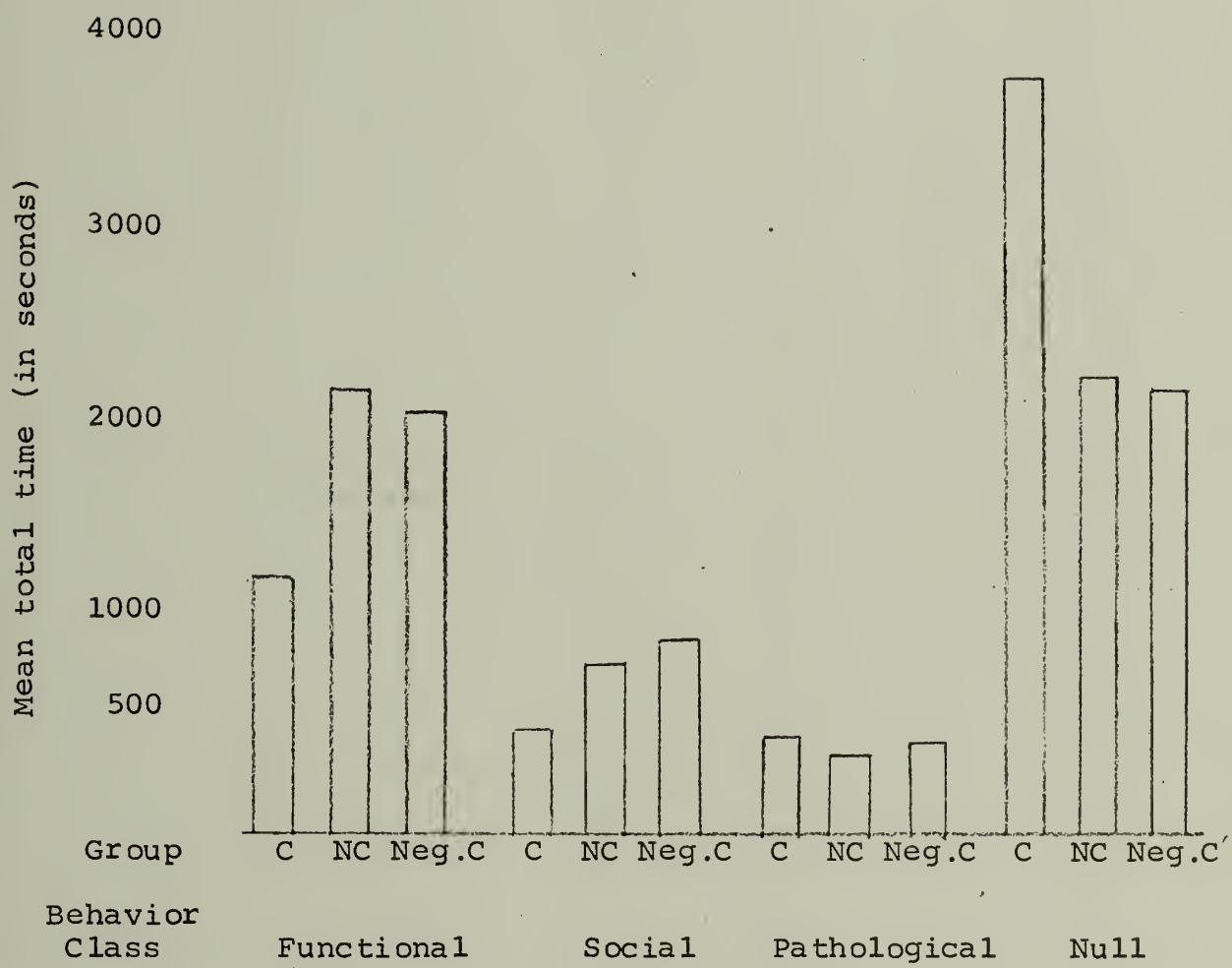
Tables 18-20 present the Behavior Category data for the conditioning and nonconditioning groups. Table 18 shows the means, standard deviations and t-tests using time data. An examination of this table reveals that conditioners spent significantly more time engaged in Non-Involved behavior ($t = 2.29$, $df = 32$, $p < .01$) and significantly less time engaged in Verbal I ($t = 2.69$, $df = 32$, $p < .01$), Verbal II ($t = 2.29$, $df = 32$, $p < .01$), and Active Entertainment ($t = 2.16$, $df = 32$, $p < .05$) behaviors than nonconditioners. Table 19 presents the means, standard deviations and t-tests using the frequency data. Conditioners had a significantly smaller frequency of Verbal I ($t = 2.91$, $df = 32$, $p < .01$), and Verbal II ($t = 1.90$, $df = 32$, $p < .05$) behaviors. Table 20 exhibits the means, standard deviations and t-tests

using average time per behavior data. Conditioners showed significantly more average time per Non-Involved behavior ($t = 2.41$, $df = 32$, $p < .01$), and significantly less average time per Verbal I ($t = 2.12$, $df = 32$, $p < .05$) and Verbal II ($t = 2.04$, $df = 32$, $p < .05$) behaviors.

Tables 21-23 present the means, standard deviations and t-tests using time, frequency and average time per behavior data for the conditioning and negative conditioning groups. Observation of Table 21 reveals that conditioners spent significantly more time engaged in Non-Involved behavior ($t = 1.88$, $df = 22$, $p < .05$) and significantly less time engaged in Verbal I ($t = 3.03$, $df = 22$, $p < .01$) and Verbal II ($t = 1.84$, $df = 22$, $p < .05$ behaviors. Table 23 indicates that conditioners exhibited significantly more average time per Non-Involved behavior ($t = 3.29$, $df = 22$, $p < .01$), and significantly less average time per Verbal II ($t = 1.97$, $df = 22$, $p < .05$) behaviors than negative conditioners.

Figure 1

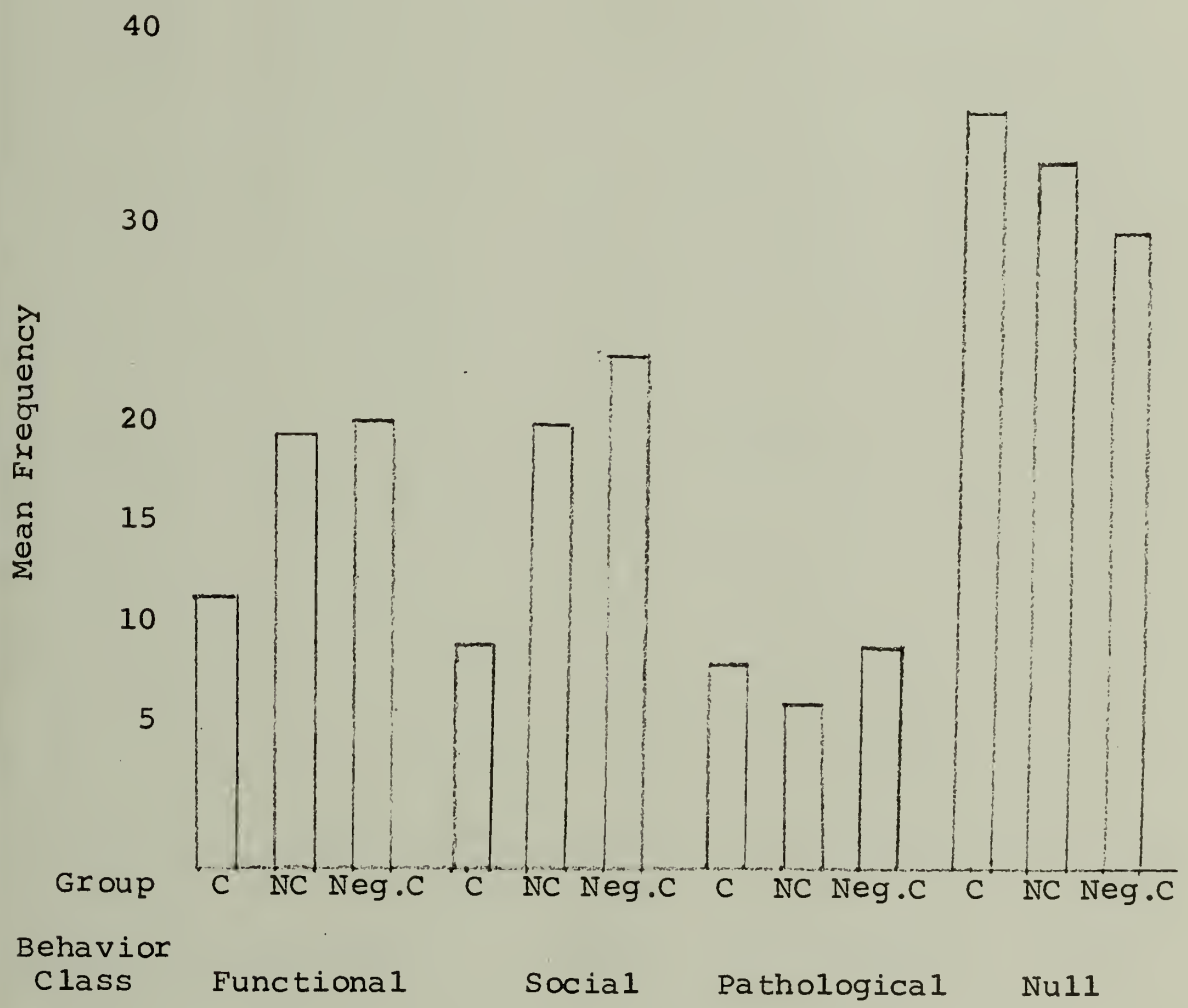
Mean Time per Behavior Class for the Conditioning, Nonconditioning and Negative Conditioning Groups




C = Conditioners
NC = Nonconditioners
Neg.C = Negative Conditioners

Figure 2

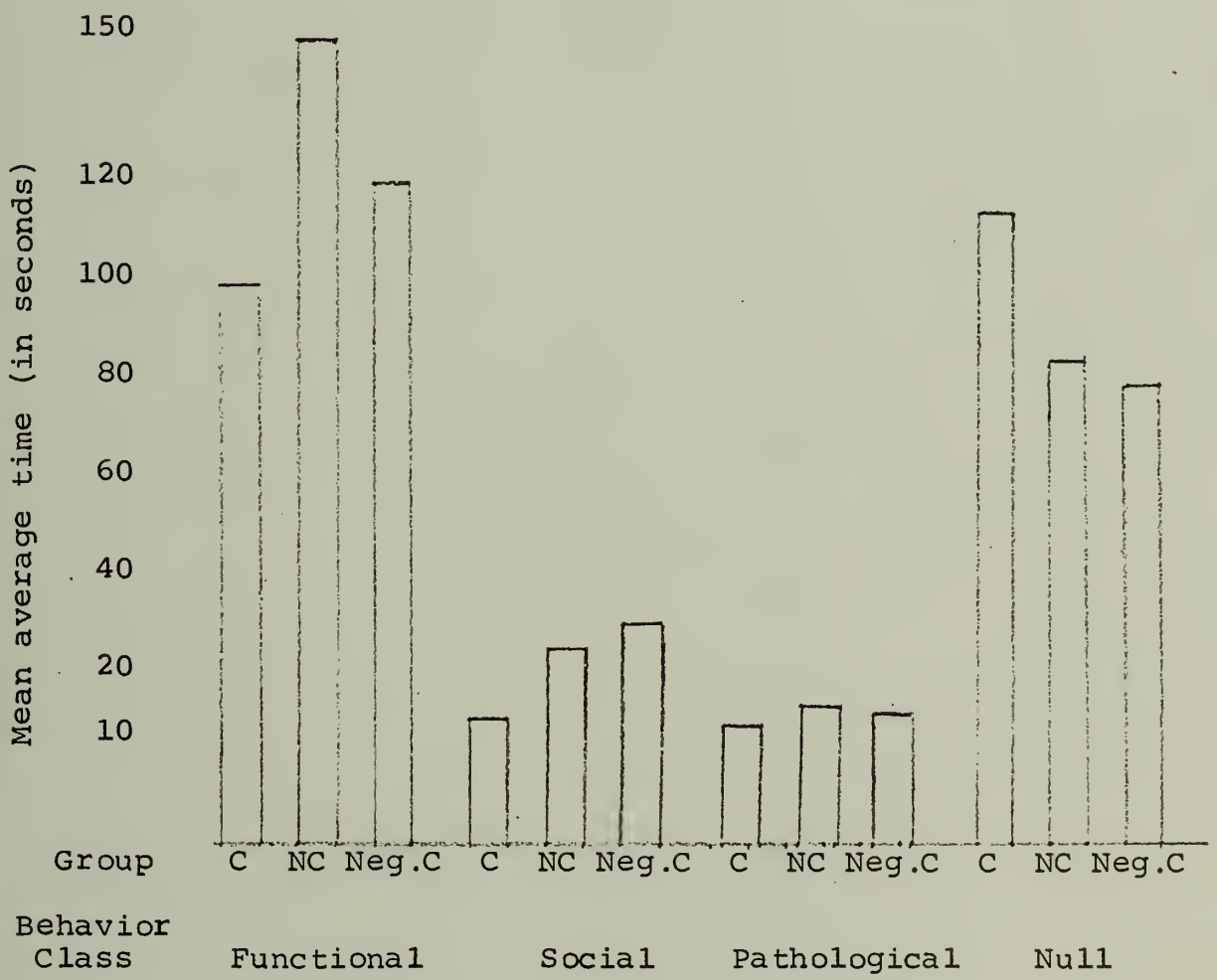
Mean Frequency per Behavior Class for the Conditioning, Nonconditioning and Negative Conditioning Groups




C = Conditioners
NC = Nonconditioners
Neg.C = Negative Conditioners

Figure 3

Mean Average Time per Behavior Class for the Conditioning, Nonconditioning and Negative Conditioning Groups




C = Conditioners
NC = Nonconditioners
Neg.C = Negative Conditioners

TABLE 1

Means and Standard Deviations for Social Behaviors using time, frequency and average time per behavior data across Conditioning, Nonconditioning and Negative Conditioning groups.

| Data | Conditioning Schizophrenics | Nonconditioning Schizophrenics | Neg. Cond. Schizophrenics |
|---|---|---|---|
| Time (in seconds) | | | |
| Mean | 194.88 | 615.70 | 699.66 |
| S. D. | 213.07 | 527.10 | 501.03 |
| Frequency | | | |
| Mean | 9.32 | 19.18 | 23.33 |
| S. D. | 7.27 | 12.15 | 6.11 |
| Average time per behavior (in seconds) | | | |
| Mean | 18.28 | 27.54 | 29.06 |
| S. D. | 7.82 | 12.63 | 16.16 |

TABLE 2

Analysis of Variance of Social Behaviors using time data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 1910053 | 2 | 955026 | 5.76* |
| Within groups | 6136468 | 37 | 165850 | |
| Total | 8046521 | 39 | | |

*$p < .005$

TABLE 3

Summary of Scheffe Multiple Group Comparisons

| Group Comparison | Significance | Group Showing Larger Amount of Behavior |
|---|---|---|
| Null (time data, Table 11) | | |
| 1 x 2 | S | 1 |
| 1 x 3 | S | 1 |
| 1 x 2 + 3 | S | 1 |
| Null (ATB data, Table 13) | | |
| 1 x 2 | S | 1 |
| 1 x 3 | S | 1 |
| 1 x 2 + 3 | S | 1 |
| Social (time data, Table 2) | | |
| 1 x 2 | S | 2 |
| 1 x 3 | S | 3 |
| 1 x 2 + 3 | S | 2 + 3 |
| Social (frequency data, Table 4) | | |
| 1 x 2 | S | 2 |
| 1 x 3 | S | 3 |
| 1 x 2 + 3 | S | 2 + 3 |
| Social (ATB data, Table 5) | | |
| 1 x 2 | S | 2 |
| 1 x 3 | S | 3 |
| 1 x 2 + 3 | S | 2 + 3 |
| Functional (time data, Table 7) | | |
| 1 x 2 | S | 2 |
| 1 x 3 | NS | |
| 1 x 2 + 3 | S | 2 + 3 |
| Functional (frequency data, Table 8) | | |
| 1 x 2 | S | 2 |
| 1 x 3 | S | 3 |
| 1 x 2 + 3 | S | 2 + 3 |

Group 1 = Conditioners
Group 2 = Nonconditioners
Group 3 = Neg. Cond.

S = significant on the Scheffe test at .05
NS = not significant
ATB = average time per behavior

TABLE 4

Analysis of Variance of Social Behaviors using frequency data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 1320 | 2 | 660 | 5.59* |
| Within groups | 4380 | 37 | | |
| Total | 5700 | 39 | | |

*$p < .005$

TABLE 5

Analysis of Variance of Social Behaviors using average time per behavior data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 1721 | 2 | 865.5 | 9.31* |
| Within groups | 3439 | 37 | 92.8 | |
| Total | 5260 | 39 | | |

*$p < .001$

TABLE 6

Means and Standard Deviations for Functional Behaviors using time, frequency and average time per behavior data across Conditioning, Nonconditioning and Negative Conditioning groups.

| Data | Conditioning Schizophrenics | Nonconditioning Schizophrenics | Neg. Cond. Schizophrenics |
|---|---|---|---|
| Time (in seconds) | | | |
| Mean | 1193.72 | 2317.00 | 2268.90 |
| S. D. | 1236.58 | 1354.78 | 1444.66 |
| Frequency | | | |
| Mean | 10.66 | 16.76 | 19.50 |
| S. D. | 7.94 | 7.11 | 10.70 |
| Average time per behavior (in seconds) | | | |
| Mean | 97.02 | 135.97 | 112.98 |
| S. D. | 45.45 | 68.52 | 70.61 |

TABLE 7

Analysis of Variance of Functional Behaviors using time data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 1184529 | 2 | 5922639 | 3.47* |
| Within groups | 63213152 | 37 | 1798463 | |
| Total | 75058431 | 39 | | |

*$p < .025$

TABLE 8

Analysis of Variance of Functional Behaviors using frequency data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 475 | 2 | 237.5 | 3.50* |
| Within groups | 2528 | 37 | 68.3 | |
| Total | 3003 | 39 | | |

*$p < .025$

TABLE 9

Analysis of Variance of Functional Behaviors using average time per behavior data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 10470 | 2 | 5235 | 1.62 |
| Within groups | 119043 | 37 | 3218 | |
| Total | 129513 | 39 | | |

TABLE 10

Means and Standard Deviations for Null Behaviors using time, frequency and average time per behavior data across Conditioning, Nonconditioning and Negative Conditioning groups.

| Data | Conditioning Schizophrenics | Nonconditioning Schizophrenics | Neg. Cond. Schizophrenics |
|---|---|---|---|
| Time (in seconds) | | | |
| Mean | 3783.05 | 2615.56 | 2231.50 |
| S. D. | 1476.10 | 1491.26 | 1722.30 |
| Frequency | | | |
| Mean | 34.44 | 31.75 | 28.66 |
| S. D. | 10.13 | 13.28 | 15.18 |
| Average time per behavior (in seconds) | | | |
| Mean | 113.09 | 81.42 | 74.25 |
| S. D. | 46.47 | 31.98 | 34.55 |

TABLE 11

Analysis of Variance of Null Behaviors using time data for the Conditioning, Noncinditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 16548539 | 2 | 8274269 | 3.72* |
| Within groups | 82266019 | 37 | 2223404 | |
| Total | 98814558 | 39 | | |

*$p < .025$

TABLE 12

Analysis of Variance of Null Behaviors using frequency data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 525 | 2 | 262.5 | 1.49 |
| Within groups | 6479 | 37 | 175 | |
| Total | 7004 | 39 | | |

TABLE 13

Analysis of Variance of Null Behaviors using average time per behavior data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 11308 | 2 | 5654 | 3.49* |
| Within groups | 59952 | 37 | 1620 | |
| Total | 71260 | 39 | | |

*$p < .025$

TABLE 14

Means and Standard Deviations for Pathological Behaviors using time, frequency and average time per behavior data across Conditioning, Nonconditioning and Negative Conditioning groups.

| Data | Conditioning Schizophrenics | Nonconditioning Schizophrenics | Neg. Cond. Schizophrenics |
|---|---|---|---|
| Time (in seconds) | | | |
| Mean | 149.27 | 117.00 | 119.16 |
| S. D. | 234.60 | 230.56 | 250.84 |
| Frequency | | | |
| Mean | 7.27 | 4.87 | 8.33 |
| S. D. | 9.78 | 6.68 | 13.51 |
| Average time per behavior (in seconds) | | | |
| Mean | 17.48 | 23.10 | 12.97 |
| S. D. | 11.35 | 19.83 | 12.52 |

TABLE 15

Analysis of Variance of Pathological Behaviors using time data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 53496 | 2 | 26748 | .48 |
| Within groups | 2055531 | 37 | 55554 | |
| Total | 2109027 | 39 | | |

TABLE 16

Analysis of Variance of Pathological Behaviors using frequency data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 97 | 2 | 48.5 | .59 |
| Within groups | 2993 | 37 | 80.9 | |
| Total | 3090 | 39 | | |

TABLE 17

Analysis of Variance of Pathological Behaviors using average time per behavior data for the Conditioning, Nonconditioning and Negative Conditioning groups.

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Between groups | 218 | 2 | 109 | .52 |
| Within groups | 7826 | 37 | 211 | |
| Total | 8044 | 39 | | |

TABLE 18

Means and Standard Deviations for the Twelve Behavior Categories using time data (in seconds), across the Conditioning and Nonconditioning groups.

| Category | Conditioning Schizophrenics | Nonconditioning Schizophrenics | t |
|---|---|---|---|
| Non-Involvement | | | |
| Mean | 3647.55 | 2495.44 | 2.29* |
| S. D. | 1495.57 | 1427.12 | |
| Self-Stimulatory | | | |
| Mean | 135.50 | 120.12 | .31 |
| S. D. | 132.90 | 133.46 | |
| Verbal I | | | |
| Mean | 87.44 | 323.39 | -2.69* |
| S. D. | 120.65 | 306.87 | |
| Verbal II | | | |
| Mean | 85.16 | 259.92 | -2.29* |
| S. D. | 81.21 | 285.72 | |
| Non-Verbal Interpersonal | | | |
| Mean | 21.83 | 32.47 | -.57 |
| S. D. | 51.71 | 53.02 | |
| Pacing | | | |
| Mean | 611.66 | 371.37 | .93 |
| S. D. | 931.44 | 285.63 | |

*$p < .01$

TABLE 18--Continued

| Category | Conditioning Schizophrenics | Nonconditioning Schizophrenics | t |
|---|---|---|---|
| Passive Entertainment | | | |
| Mean | 1019.38 | 1552.78 | -1.50 |
| S. D. | 1093.41 | 916.37 | |
| Active Entertainment | | | |
| Mean | 174.34 | 764.22 | -2.17* |
| S. D. | 523.24 | 929.17 | |
| Bizarre | | | |
| Mean | 132.83 | 109.75 | .23 |
| S. D. | 197.15 | 197.89 | |
| Atavistic | | | |
| Mean | 16.44 | 7.25 | .86 |
| S. D. | 40.80 | 19.08 | |
| Reinforcement | | | |
| Mean | 15.38 | 17.06 | -.34 |
| S. D. | 16.58 | 30.22 | |
| Non-Classificatory | | | |
| Mean | 7.33 | 12.31 | -.49 |
| S. D. | 20.24 | 37.92 | |

*$p < .01$

TABLE 19

Means and Standard Deviations for the Twelve Behavior Categories using frequency data, across the Conditioning and Nonconditioning groups.

| Category | Conditioning Schizophrenics | Nonconditioning Schizophrenics | t |
|---|---|---|---|
| Non-Involvement | | | |
| Mean | 26.06 | 23.38 | 1.04 |
| S. D. | 7.66 | 9.60 | |
| Self-Stimulatory | | | |
| Mean | 8.38 | 8.37 | .00 |
| S. D. | 4.38 | 5.12 | |
| Verbal I | | | |
| Mean | 4.66 | 11.25 | -2.91** |
| S. D. | 4.74 | 9.97 | |
| Verbal II | | | |
| Mean | 3.66 | 6.75 | -1.90 |
| S. D. | 3.18 | 5.89 | |
| Non-Verbal Interpersonal | | | |
| Mean | 1.00 | 1.18 | -.40 |
| S. D. | 1.28 | 1.39 | |
| Pacing | | | |
| Mean | 8.11 | 8.25 | -.05 |
| S. D. | 8.77 | 5.66 | |

*$p < .05$
**$p < .01$

TABLE 19--Continued

| Category | Conditioning Schizophrenics | Nonconditioning Schizophrenics | t |
|---|---|---|---|
| Passive Entertainment | | | |
| Mean | 10.00 | 14.40 | -.80 |
| S. D. | 7.22 | 6.13 | |
| Active Entertainment | | | |
| Mean | .66 | 2.36 | -1.81* |
| S. D. | 1.52 | 2.43 | |
| Bizarre | | | |
| Mean | 6.11 | 4.31 | .89 |
| S. D. | 6.91 | 8.18 | |
| Atavistic | | | |
| Mean | 1.16 | .56 | .80 |
| S. D. | 2.92 | 1.05 | |
| Reinforcement | | | |
| Mean | .33 | .37 | -.23 |
| S. D. | .57 | .59 | |
| Non-Classificatory | | | |
| Mean | .16 | .17 | .00 |
| S. D. | .36 | .47 | |

*$p < .05$

TABLE 20

Means and Standard Deviations for the Twelve Behavior Categories using average time per behavior data (in seconds), across the Conditioning and Nonconditioning groups.

| Category | Conditioning Schizophrenics | Nonconditioning Schizophrenics | t |
|---|---|---|---|
| Non-Involved | | | |
| Mean | 141.64 | 102.71 | 2.41** |
| S. D. | 55.13 | 38.18 | |
| Self-Stimulatory | | | |
| Mean | 13.80 | 11.73 | .71 |
| S. D. | 8.30 | 8.62 | |
| Verbal I | | | |
| Mean | 16.65 | 24.46 | -2.12* |
| S. D. | 7.44 | 12.68 | |
| Verbal II | | | |
| Mean | 21.39 | 32.20 | -2.04* |
| S. D. | 11.15 | 16.56 | |
| Non-Verbal Interpersonal | | | |
| Mean | 15.21 | 43.24 | -1.29 |
| S. D. | 13.37 | 63.76 | |
| Pacing | | | |
| Mean | 75.42 | 53.59 | 1.31 |
| S. D. | 46.92 | 43.09 | |

*$p < .05$
**$p < .01$

TABLE 20--Continued

| Category | Conditioning Schizophrenics | Nonconditioning Schizophrenics | t |
|---|---|---|---|
| Passive Entertainment | | | |
| Mean | 91.63 | 108.06 | -1.03 |
| S. D. | 45.86 | 46.89 | |
| Active Entertainment | | | |
| Mean | 213.87 | 313.04 | -1.32 |
| S. D. | 120.59 | 154.06 | |
| Bizarre | | | |
| Mean | 18.16 | 20.42 | -.30 |
| S. D. | 12.91 | 20.57 | |
| Atavistic | | | |
| Mean | 15.10 | 14.05 | .74 |
| S. D. | 6.06 | 8.26 | |
| Reinforcement | | | |
| Mean | 30.40 | 55.33 | 1.15 |
| S. D. | 16.19 | 35.23 | |
| Non-Classificatory | | | |
| Mean | 44.00 | 66.34 | .99 |
| S. D. | 35.59 | 48.08 | |

TABLE 21

Means and Standard Deviations for the Twelve Behavior Categories using time data (in seconds), across the Conditioning and Negative Conditioning groups.

| Category | Conditioning Schizophrenics | Neg. Conditioning Schizophrenics | t |
|---|---|---|---|
| Non-Involved | | | |
| Mean | 3647.55 | 2153.67 | 1.88* |
| S. D. | 1495.57 | 1784.37 | |
| Self-Stimulatory | | | |
| Mean | 135.50 | 77.83 | 1.60 |
| S. D. | 132.99 | 90.25 | |
| Verbal I | | | |
| Mean | 87.44 | 344.00 | -3.03** |
| S. D. | 120.65 | 194.50 | |
| Verbal II | | | |
| Mean | 85.16 | 345.33 | -1.84* |
| S. D. | 81.21 | 312.03 | |
| Non-Verbal Interpersonal | | | |
| Mean | 21.83 | 10.33 | 1.01 |
| S. D. | 51.71 | 8.55 | |
| Pacing | | | |
| Mean | 611.66 | 611.83 | -.21 |
| S. D. | 931.44 | 683.88 | |

*$p < .05$
**$p < .01$

TABLE 21--Continued

| Category | Conditioning Schizophrenics | Neg. Conditioning Schizophrenics | t |
|---|---|---|---|
| Passive Entertainment | | | |
| Mean | 1019.38 | 1343.83 | -.49 |
| S. D. | 1093.41 | 819.65 | |
| Active Entertainment | | | |
| Mean | 174.34 | 924.17 | -1.60 |
| S. D. | 523.24 | 1000.86 | |
| Bizarre | | | |
| Mean | 132.83 | 102.66 | .32 |
| S. D. | 197.15 | 177.07 | |
| Atavistic | | | |
| Mean | 16.44 | 16.50 | .00 |
| S. D. | 40.80 | 33.86 | |
| Reinforcement | | | |
| Mean | 15.38 | 99.50 | -1.63 |
| S. D. | 16.58 | 98.77 | |
| Non-Classificatory | | | |
| Mean | 7.33 | 26.33 | -.03 |
| S. D. | 20.24 | 39.55 | |

TABLE 22

Means and Standard Deviations for the Twelve Behavior Categories using frequency data, across the Conditioning and Negative Conditioning groups.

| Category | Conditioning Schizophrenics | Neg. Conditioning Schizophrenics | t |
|---|---|---|---|
| Non-Involved | | | |
| Mean | 26.06 | 21.83 | 1.17 |
| S. D. | 7.66 | 13.11 | |
| Self-Stimulatory | | | |
| Mean | 8.38 | 6.86 | .97 |
| S. D. | 4.38 | 3.54 | |
| Verbal I | | | |
| Mean | 4.66 | 12.83 | -3.38** |
| S. D. | 4.74 | 3.00 | |
| Verbal II | | | |
| Mean | 3.66 | 9.16 | -1.91* |
| S. D. | 3.18 | 6.25 | |
| Non-Verbal Interpersonal | | | |
| Mean | 1.00 | 1.33 | -.42 |
| S. D. | 1.28 | 1.59 | |
| Pacing | | | |
| Mean | 8.11 | 9.33 | .52 |
| S. D. | 8.77 | 9.09 | |

*$p < .05$
**$p < .01$

TABLE 22--Continued

| Category | Conditioning Schizophrenics | Neg. Conditioning Schizophrenics | t |
|---|---|---|---|
| Passive Entertainment | | | |
| Mean | 10.00 | 17.00 | -1.58 |
| S. D. | 7.22 | 10.49 | |
| Active Entertainment | | | |
| Mean | .66 | 2.50 | -1.47 |
| S. D. | 1.52 | 2.69 | |
| Bizarre | | | |
| Mean | 6.11 | 6.00 | .02 |
| S. D. | 6.91 | 8.18 | |
| Atavistic | | | |
| Mean | 1.16 | 2.33 | -.52 |
| S. D. | 2.92 | 4.78 | |
| Reinforcement | | | |
| Mean | .33 | .83 | -1.61 |
| S. D. | .57 | .68 | |
| Non-Classificatory | | | |
| Mean | .16 | .33 | -.85 |
| S. D. | .36 | .46 | |

TABLE 23

Means and Standard Deviations for the Twelve Behavior Categories using average time per behavior data (in seconds), across the Conditioning and Negative Conditioning groups.

| Category | Conditioning Schizophrenics | Neg. Conditioning Schizophrenics | t |
|---|---|---|---|
| Non-Involved | | | |
| Mean | 141.64 | 82.48 | 3.29** |
| S. D. | 55.13 | 30.61 | |
| Self-Stimulatory | | | |
| Mean | 13.80 | 8.95 | 1.38 |
| S. D. | 8.30 | 7.15 | |
| Verbal I | | | |
| Mean | 16.65 | 25.85 | -1.36 |
| S. D. | 7.44 | 15.86 | |
| Verbal II | | | |
| Mean | 21.39 | 38.56 | -1.97* |
| S. D. | 11.15 | 21.35 | |
| Non-Verbal Interpersonal | | | |
| Mean | 15.21 | 8.07 | 1.43 |
| S. D. | 13.37 | 5.37 | |
| Pacing | | | |
| Mean | 75.42 | 51.18 | 1.51 |
| S. D. | 46.92 | 29.44 | |

*$p < .05$
**$p < .01$

TABLE 23--Continued

| Category | Conditioning Schizophrenics | Neg. Conditioning Schizophrenics | t |
|---|---|---|---|
| Passive Entertainment | | | |
| Mean | 91.63 | 81.70 | .50 |
| S. D. | 45.86 | 39.93 | |
| Active Entertainment | | | |
| Mean | 213.87 | 378.47 | -1.79* |
| S. D. | 120.59 | 138.27 | |
| Bizarre | | | |
| Mean | 18.16 | 12.46 | .75 |
| S. D. | 12.91 | 11.45 | |
| Atavistic | | | |
| Mean | 15.10 | 7.00 | 2.31 (5 df) |
| S. D. | 6.06 | 0.00 | |
| Reinforcement | | | |
| Mean | 30.40 | 127.66 | -1.55 |
| S. D. | 16.19 | 107.81 | |
| Non-Classificatory | | | |
| Mean | 44.00 | 67.66 | -.55 |
| S. D. | 35.59 | 76.06 | |

*$p < .05$

# DISCUSSION

Research over the last fifteen years has indicated that some schizophrenics verbally condition whereas others do not. An important step towards the understanding of why a schizophrenic does or does not condition would seem to be the elucidation of characteristics of conditioners and nonconditioners. This area of investigation has received little theoretical and experimental attention, especially with regard to the delineation of more comprehensive and global behavioral and personality correlates of performance on verbal conditioning. This study proposed to compare the overt ward behaviors of conditioning and nonconditioning schizophrenics, judging that these behaviors provide objective and comprehensive data upon which to base inferences about subject characteristics.

Some previous attempts to understand differential performance on verbal conditioning among schizophrenics have taken as their explanatory model what is now generally referred to as the schizophrenic psychological deficit assumption. Drawing from findings which suggested that performance on many psychological tasks is impaired by psychopathology, some researchers (Leventhal, 1962; Johanssen and Campbell, 1964) have implied that less disturbed schizophrenics condition better than more disturbed schizophrenics.

The schizophrenic's degree of psychopathology, however, may not be an appropriate correlate of performance on verbal conditioning, for much research has shown that more severely ill schizophrenics do not always perform worse than less severely ill schizophrenics on a variety of operant tasks. A more appropriate correlate might be a schizophrenic's overall "conditionability." Ward behaviors may reflect differences in conditionability among hospitalized schizophrenics, judging from the observations and experimental findings of previous researchers (Ayllon, 1959; Goffman, 1961; Ullman and Krasner, 1965; Mendelsohn, 1969) that hospitalization has strong effects on patient ward behaviors. A highly conditionable schizophrenic might be expected to show more strongly these hospitalization effects, which can be summarized as a depressed behavior profile. It was consequently predicted in this study that schizophrenics who verbally conditioned would manifest a more severely depressed behavior profile than those who did not condition, and this formed the basis for three specific behavioral hypotheses.

Hypothesis 1 predicted that schizophrenics who verbally conditioned would show fewer Social behaviors than those who did not. This Behavior Class included all verbal behavior between the subject and any other person, plus nonverbal interpersonal behavior. Two groups of schizophrenics who did not positively condition were formed. This first group, called nonconditioners, consisted of schizophrenics

who showed no change between their operant and criterion rates. The second, smaller group, called negative conditioners, consisted of schizophrenics who showed a drop in operant rate larger than would be expected by chance. Hypothesis 1 was confirmed: conditioners, as predicted, evidencing significantly less time, frequency, and average time per behavior for Social behaviors than nonconditioners, negative conditioners or the latter two groups combined. Essentially, these results were reflected in the performances of the 3 groups on the Behavior Categories which made up the Social Behavior Class; conditioners showing significantly less verbal behavior with staff and other patients than the two other groups. Nonconditioners and negative conditioners did not significantly differ on any of the Behavior Classes or the Behavior Categories.

The performance of the 3 groups on the Social Behavior Class is perhaps the most surprising finding of this study. One would tend to assume that the more verbal patients would do better on the verbal conditioning, a task which so fundamentally involves verbal behavior. Such conjecture, however, rests on the inference that more normal-behaving schizophrenics will do better on psychological tasks--the psychological deficit assumption. What this line of thinking fails to take into consideration is the significance of verbal and social behaviors in the context of hospitalization. Mendelsohn (1969) has shown that hospitalization

depresses Social behaviors over time. Goffman (1961) and Ullman and Krasner (1965) have pointed to negative attitudes on the part of many staff members towards active and social patients. Glassman (1969) found an almost significant negative correlation between nurses' ratings of patient likeability and manageability and patient Social behaviors. High levels of verbal and social behavior, therefore, are suggestive of lack of responsiveness to the demands, staff preferences and general conditioning directions of hospitalization. On a global level, then, schizophrenics with high levels of Social behavior could be seen as less compliant and conditionable in the conditioning situation of hospitalization, which seems to fit in with their being less conditionable in the verbal conditioning situation. More specifically, as will be discussed more fully below, the nonconditioners and negative conditioners, judging from their higher levels of Social behaviors, get more social reinforcement than conditioners, and this may contribute towards their being less needy of and responsive to the social reinforcement which is the reward in the verbal conditioning.

Hypothesis 2 predicted that conditioners would show less Functional behaviors than either nonconditioners or negative conditioners. Functional behaviors are those which involve use of the objects and resources of the environment, such as pool and card playing, television watching, and reading. These are behaviors which keep the patient

"functional" (Hunter, Schooler and Spohn, 1962) on the ward. An examination of the results reveals that conditioners spent less total time engaged in Functional behaviors than nonconditioners, and nonconditioners and negative conditioners combined. Conditioners showed a trend toward spending less time engaged in Functional behaviors than negative conditioners. The fact that significance was not obtained may well be due to the small n (6) of the negative conditioning group. In fact, the difference in means for time spent engaged in Functional behaviors for the negative conditioning and conditioning groups was almost identical to the differences in means between the nonconditioning and conditioning groups, where significance was obtained. Conditioners also performed Functional behaviors significantly less frequently than the two other groups. The two Behavior Categories which formed the Functional Behavior Class were Active Entertainment and Passive Entertainment behaviors. Active Entertainment behaviors differentiated the conditioners and nonconditioners (nonconditioners, as predicted, showing more), whereas Passive Entertainment behaviors did not. This may be due to the fact that some Passive Entertainment behaviors, such as watching television, require minimal amounts of interaction with the environment, and hence are performed with some frequency by the conditioners. Although approaching significance in the predicted directions, there were no significant differences between the conditioners and negative

conditioners for either Active or Passive Entertainment behaviors. To repeat, this may be due to the small n of the negative conditioning group.

Once again, as with Social behaviors, one would expect that schizophrenics high on Functional behaviors, meaning that these Ss are more responsive to and have more experience with manipulating and responding to objective stimuli in the environment, would be more responsive to and do better on the verbal conditioning, a task involving objective stimuli (the stimulus card with the verb and pronouns), and some attention and concentration. Previous theorization and research, however, have suggested that high levels of Functional behaviors do not correlate with high conditionability, but rather the opposite. Supporting this position are Goffman's (1961) observation that hospital staff tend to prefer low levels of ward activity, Elstein and Van Pelt's (1966) finding that nursing staff liked less active patients, Glassman's (1969) notation of a significant positive correlation between nurses' dislike of patients and these patients' Active Entertainment behaviors, and Mendelsohn's (1969) finding that the average hospitalized schizophrenic's Functional behaviors decreased over time in the hospital. In sum, the low level of Functional and Social behaviors shown by the conditioners suggests high responsivity to hospital conditioning, which gives some confirmation to the overall hypothesis that

verbal conditionability is positively correlated with overall conditionability.

Hypothesis 3 predicted that conditioners would show more Null behaviors than the two other groups. These are behaviors in which there is no noticeable overt interaction with any of the objects or people in the environment. Hypothesis 3 was confirmed: conditioners showing significantly more total time and average time per behavior for Null and Non-Involved (the category making up the largest amount of the Null Behavior Class) behaviors than nonconditioners, negative conditioners, or the two latter groups combined. Conditioners spent, on the average, seventy per cent of their time engaged in Null behaviors. The comparable figures for the nonconditioners and negative conditioners are, respectively, forty-three and forty per cent. Over one-third of the conditioners spent ninety or more per cent of their time on the ward engaged in Null behaviors, which could loosely be described as "doing nothing." To an observer on the ward, most conditioners would appear to the "chronics," "process schizophrenics," "burnt-out" schizophrenics, etc.,--clearly very psychologically disturbed. As has long been theorized (Meyerson, 1939; Schooler and Parkel, 1962; and others) and recently been experimentally demonstrated (Mendelsohn, 1969), increases in Null behaviors are one of the strongest effects of hospitalization. With the suppression of Social and Functional behaviors and the unstimulating environment of

the ward, "behavior deficits" (Ferster, 1961) would seem likely to occur, one significant result of this being increases in Null behaviors (Mendelsohn, 1969).

The significantly higher level of Null behaviors shown by the conditioners is, along with their significantly lower levels of Social and Functional behaviors, the last part of the depressed behavior profile which many have theorized and Mendelsohn (1969) has experimentally demonstrated to be the frequent result of hospital conditioning upon patient behaviors. It is the behavior profile thought by researchers such as Ayllon (1959), Goffman (1961), and Ullman and Krasner (1965), and shown, in part by the findings of Elstein and Van Pelt (1966) and Glassman (1969), to be preferred by many staff, since patients showing this behavior profile are generally easy to take care of, something perhaps highly appreciated by staff, particularly when there is a low ratio of staff to patients and some patients are being very disruptive. These schizophrenics, then, who verbally conditioned evidenced behavior patterns which previous research has suggested is either brought about, or, in cases where the patient came to the hospital already manifesting such depressed behavior patterns, maintained by hospitalization. It could, consequently, be inferred that schizophrenics who positively verbally conditioned in this study were highly conditionable overall.

It does not appear that the argument can be made that verbal conditionability in schizophrenia is solely a function of length of hospitalization experience, since the 3 groups did not differ on this variable. Judging from this finding and from detailed observation of the data, there were some short-term schizophrenics already conditionable in that they verbally conditioned and also exhibited depressed behavior profiles, and some long-term patients who appear to be low on conditionability since they did not verbally condition and showed active behavior profiles. From these observations, it appears that the individual schizophrenic's conditionability is a key variable in its own right, although it is influencable in many cases by length of hospitalization. A fuller discussion of possible types and results of interactions between a schizophrenic's conditionability and hospitalization experience is presented below (p. 84).

An examination of the behaviors of the nonconditioners and negative conditioners reveals that these two groups exhibited more Social and Functional and fewer Null behaviors than the conditioners. The nonconditioners and negative conditioners both could be characterized as more active, extroverted, social, explorative and seeking mastery over their environments than the conditioners. The behavior patterns of the nonconditioners and negative conditioners, especially in contrast to the behaviors of the conditioners, closely resembles the behavior patterns of schizophrenic

patients in a previous study rated by nurses as less liked and less manageable (Glassman, 1969). In possessing behavior patterns disliked by nurses and contrary to patterns produced by hospitalization (Mendelsohn, 1969), the nonconditioners and negative conditioners could well be considered resistant to the hospitalization conditioning process, and therefore, in a sense, negativistic to hospitalization. This is in accord with Goldman's (1968) finding that patients who achieved superior post-hospital adjustment were those who most rejected their identities as patients and most resisted staff control. Herein may lie one of the reasons why, as predicted, nonconditioners and negative conditioners showed sufficient Pathological (bizarre, destructive, atavistic) behaviors so that they did not differ on any of the measures of this Behavior Class from conditioners, for, as Goffman (1961) has pointed out, Pathological behaviors can be one of the tactics by means of which a patient negativistic to hospitalization can express his resistance to the influence of the hospital. Thus, in some schizophrenics, Pathological behaviors along with other active behaviors could be an indication of low conditionability, whereas in inactive patients they could indicate high conditionability in that they result from behavior deficits caused by hospitalization being filled in by inappropriate behaviors (Mendelsoh, 1969). These may be the reasons that there was no consistent relationship between verbal conditioning performance and

Pathological behaviors, but further research is indicated for fuller clarification and confirmation.

Whereas there were no significant differences on the present measures of Pathological behaviors, finer discrimination of this Behavior Class might reveal qualitative differences in the Pathological behaviors of the 3 groups. Pathological behaviors were defined as behaviors judged by the observer to be unusual or odd in the situation. These behaviors ranged from relatively passive behaviors, such as making strange faces or talking to oneself in a barely audible voice, to highly active behaviors, such as throwing objects, striking others or yelling out bizarre or offensive language. Subdividing Pathological behaviors along active-passive lines might result in nonconditioners and negative conditioners showing significantly more active and less passive Pathological behaviors, judging from the behavior profiles of the 3 groups. Confirming and perhaps expanding upon this inference is a task for future research.

Why the behaviors of the nonconditioners and the negative conditioners did not differ is difficult to explain. Perhaps the negative conditioners were more resistant to the hospital and staff than the nonconditioners, though they were unwilling to make it openly visible on the ward in the interest of not antagonizing the staff to the point where it might interfere seriously with privileges and perhaps discharge. Or perhaps they were more negativistic to the

tester or to a testing situation. It may be that the testing situation, or positive verbal reinforcement in particular, was more disturbing to the negative conditioners due to some past experiences. Previous research sheds no light on this question, since not one study of verbal conditioning with schizophrenics reports negative conditioning. Further research again seems indicated.

In any event, both the negative conditioners and non-conditioners were not positively responsive to the reinforcements of the verbal conditioning task, and also evidenced behaviors suggestive of lack of responsiveness to demands, staff preferences and general conditioning directions of hospitalization. Or, in other words, they appear to be more negativistic and less conditionable overall than the schizophrenics who positively conditioned on the verbal conditioning.

It should be noted again that the findings of this study were obtained on the Taffel (1955) verbal conditioning procedure, and thus may not apply to the free-verbalization procedures used by other researchers. The Taffel procedure was selected because it was felt that some, if not many, schizophrenics would produce too low of an operant verbal rate for conditioning if the generally more unstructured free-verbalization procedures were used. The more structured Taffel task, which requires short and simple sentences which the experimenter initially requests and can keep requesting,

seemed more appropriate to these low verbal schizophrenics. In fact, several schizophrenics who conditioned evidenced only a few seconds of verbal behavior out of 6000 seconds of observation in the unstructured ward situation. Whether or not there would be a high correlation between conditioning by schizophrenics on the Taffel and on free-verbalization procedures, and whether there would be similar behavioral correlates to conditionability on the latter procedures are subjects for future research.

Speculating somewhat on these questions, however, it may be that some schizophrenics with depressed behavior profiles and low verbal operant rates who conditioned with the Taffel might not condition with most of the free-verbalization procedures which require the subject to make up a story or describe a picture, but might condition with simpler procedures such as repeating lists of written words. Since many of the free-verbalization procedures, particularly the widely used descriptive and story-making modalities, seem more like conversations and less like structured conditioning situations than the Taffel which is more like a specific task, some schizophrenics who are negativistic to authority and authoritative situations might show tendencies to condition better on these free-verbalization procedures than on the Taffel (providing that they had sufficiently high operant verbal rates). On the other hand, even though many free-verbalization procedures might be less authoritative and

structured than the Taffel, there is still enough structure and directiveness on the free-verbalization tasks (an experimenter and an experimental situation usually requiring attention and obedience to instructions) so that low conditionable schizophrenics still might not condition. Moreover, the reward of positive social reinforcement is the same for most verbal conditioning procedures and, as will be discussed below, responsivity to social reinforcement may be a key variable underlying verbal conditionability in schizophrenia. In general, given the many basic similarities between all of the verbal conditioning procedures, the question of differential performance on different procedures has not been of great concern to researchers in the field of verbal conditioning. Although, once again, research comparing performance on the Taffel and on free-verbalization procedures and the determination of behavioral and personality correlates of the latter is welcome, a reasonable estimation is that results will not be very different from those of the present study. This appears to be, since conditioners in this study showed behavior patterns suggestive of high conditionability to the relatively unstructured conditioning that takes place in the hospital. Consequently, the generally more unstructured free-verbalization situations might not be a deterrent (providing that the subjects had sufficiently high operant verbal rates). Moreover, if the schizophrenics with depressed behavior profiles are compliant and dependent, and highly

responsive to social reinforcement, as will be discussed later, they may even be more dependent upon and responsive to cues in the more ambiguous free-verbalization situations and hence show high conditionability with them as well. Sarason's (1958) findings with normals, using a free-verbalization procedure that subjects who conditioned were more dependent and compliant (traits which suggest high overall conditionability), and the findings of other researchers (Salzinger and Pisoni, 1958; Dinoff et al, 1962; Timmons, 1962) that schizophrenics did verbally condition on free-verbalization procedures also suggest that further research in this area will not produce results significantly different from those in this study.

The studies most in accord with the present findings are those of Sarason (1958) with normals and Vestre (1962) with schizophrenics. Sarason found that normals who conditioned were more dependent and compliant than nonconditioners. Vestre's conditioning schizophrenics scored significantly higher on Murray's scales of need Deference, n Abasement, and n Affiliation, and significantly lower on n Achievement, n Autonomy and n Dominance than nonconditioners. Such findings also suggest dependency and compliancy, which closely approximate the hypothesized high overall influencability and conditionability of the verbally conditioning schizophrenics of the present study.

The study whose findings are in apparent opposition to those of the present study is that of Johanssen and Campbell (1964). They found that schizophrenics rated higher on social responsiveness showed a trend towards conditioning better than those rated low on social responsiveness. In the present study, schizophrenics who conditioned showed significantly less Social and verbal behaviors than those who did not. The many methodological flaws in Johanssen and Campbell's study have already been discussed in detail (see above, pp. 4-5). These include the use of a crude, limited rating scale, lack of control for rater bias, and the use of very subjective indices of social responsiveness. In the present study, the indices of what one might refer to as social responsiveness, that is, measurements of the subject's social and verbal behaviors, are much more objective. This difference in the quality of the indices may account most for the differences in findings between Johanssen and Campbell's and the present study.

One implication of Johanssen and Campbell's findings seems worthy of brief discussion. In that "social non-responsiveness" is generally assumed to indicate more psychopathology than "social responsiveness," one might conclude from their findings that schizophrenics who verbally condition are less psychologically disturbed than schizophrenics who do not condition. The findings of this study again suggest otherwise. As there is no universally accepted

criterion of psychopathology, any position taken must necessarily be subjective. It is here suggested that less severely ill patients would show more behaviors adaptive to adjustment outside of the hospital (such as Social and Functional behaviors) than more severely ill patients. Furthermore, by this reasoning, less psychologically disturbed schizophrenics should show less unadaptive behaviors (such as Null behaviors, for which there is no reinforcement forthcoming) than more severely ill patients. From this position, conditioners must be considered as manifesting more psychopathology than nonconditioners and negative conditioners.

## Verbal Conditioning and Social Reinforcement

Speculating on what might underly the different performances of the groups on verbal conditioning, the patient's responsivity to social reinforcement seems of great importance. This position is derived from three observations: (1) Verbal conditioning is a situation involving social reinforcement as the reward. (2) Conditioners got much less social reinforcement than nonconditioners and negative conditioners, judging from the fact that they were engaged in significantly less Social behavior. (3) As previous research has suggested (Ayllon, 1959; Goffman, 1961; Gelfand, Gelfand and Dobson, 1962; Ullman and Krasner, 1965) staff social reinforcement is one of the potent conditioning factors of hospitalization, and, as presented above, the

behavior patterns of verbally conditioning schizophrenics appear to be in the suggested directions of conditioning that takes place in hospitalization. From these observations, two related inferences concerning the role of social reinforcement can be drawn. First, since conditioners receive much less social reinforcement than nonconditioners and negative conditioners, social reinforcement becomes a particularly powerful and effective reinforcement for the conditioners. Second, the conditioners, being generally more compliant, dependent and conditionable, are particularly positively responsive to social reinforcement in a conditioning situation.

How much of this hypothesized high responsivity to social reinforcement is a function of patient characteristics upon entering the hospital and how much is a function of experience over time inside the hospital can only be a matter of conjecture. An interaction effect would seem applicable in most cases. Judging from Sarason's findings with normals and from the fact that many patients who conditioned had only been in the hospital a short time (34% in the hospital 6 months or less), it might be inferred that many schizophrenics who verbally conditioned came into the hospital already highly responsive to social reinforcement, especially from staff, who are perceived as authorities. These schizophrenics' personalities could be characterized as dependent, compliant, passive and easily influencable. If they then behave in directions preferred by the staff and otherwise

respond to the behavior-depressing influence of the hospital, their social behaviors with other patients will tend to continue decreasing, rendering them increasingly more dependent upon staff social reinforcement. This would tend to make staff social reinforcement even more powerful, in turn depressing active social and Functional behaviors yet further. In effect, this somewhat simplified and generalized model represents a vicious cycle. Incoming patients may be susceptible to staff social reinforcement for additional reasons, such as a fear of other patients or a general inability to form and sustain normal interpersonal relations with their peers. If the latter were the case, they would be deprived of the single major source of usual social reinforcement within the hospital. Many patients, in the absence of such reinforcement, may become dependent and compliant in relation to the staff, thereby commencing or hastening the behavior-depressing cycle.

Other patients may come into the hospital less compliant and dependent and more socially adept with peers. They consequently may be more resistant and less responsive to staff social reinforcement. In many cases, however, this may change over time, especially if, for various reasons, they are not discharged within a reasonably short time. The hospital, once again, is a very powerful conditioning process in the direction of depressing social behaviors with other patients, making the patients increasingly desirous of

social reinforcement and, inferentially, increasingly responsive to the staff.

There is another question concerning schizophrenic patients and social reinforcement that seems of importance. Given that many of the behaviors (and quite possibly the attitudes) of the nonconditioners and negative conditioners are discordant with staff preferences, and given the great importance of the staff as reinforcers and overseers of privileges, transfers and discharge, how then do the nonconditioners and negative conditioners maintain their active behavior profiles? Several explanations seem of merit. First, the negative conditioners and nonconditioners showed significantly more Verbal I (with other patients) behaviors. Thus they are the recipients of more social interaction and reinforcement from other patients than conditioners and hence are less dependent upon the staff for these. An examination of the results, however, reveals that negative conditioners and nonconditioners showed more Verbal II (with staff) behaviors than conditioners. Part of the explanation for this may be that the nonconditioners and negative conditioners, being more active and assertive, may often get staff social reinforcement and contact despite varying degrees of dislike and reluctance on the part of the staff members. Previous research (Glassman, 1969) has indicated that the patients least liked and rated least manageable by nurses showed a trend towards more Verbal II behavior than patients rated as

most liked and manageable. Thus, it would appear that the staff often responds to behaviors and interacts with patients whom they do not like. To extend this, speculatively, into the qualitative nature of the verbal behavior between the staff and the nonconditioning and negative conditioning patients, it may possibly be that often these patients' verbal behavior is, variously, demanding, hostile, negativistic, sexually provocative, and even flagrantly "crazy." All of this may be disliked by the staff, who tend not to like overt expression of hostility and "craziness" (Goffman, 1961), and, consequently, these patients may be disliked for this and for their high activity levels. In spite of this, however, these patients often get attention and social interaction, which, one might maintain, is very important for experiencing and maintaining behaviors necessary for adjustment outside of the hospital.

## Implications

There would seem to be many implications of the findings of this study for the understanding and treatment of hospitalized schizophrenic patients as well as for further research. First, one can recognize as an overgeneralization the notion of an all-pervasive schizophrenic deficit with its implication that schizophrenics always have a learning and performance deficit. Acceptance of this position can easily lead to an attitude (which has an all-too-widespread

popularity) that schizophrenics, especially chronics, are so disturbed and intellectually deficient that treatment efforts on their behalf are nothing but wasted energy and resources.

The findings of this study suggest that the schizophrenic's inferior performance on psychological tasks may not always be a function of his "psychological deficits"--an innate part of the schizophrenic process--but often may be a function of (1) the type of task, (2) attributes of the subject, and, (3) his learning and experience inside the hospital. The implications of this are that if many of the deleterious (behavior depressing) aspects of hospitalization could be changed, many patients (particularly long-term schizophrenics previously thought to have been intractable to treatment because of deficits inherent in the schizophrenic process) may well be moved. This is, in effect, what the procedures and research of Ullman and Krasner (1965) and Ayllon (1959) seem to have shown. Both of these treatment procedures, especially the latter, make use of behavioral training with special emphasis on selective, appropriate and extensive social reinforcement from staff. They both have produced marked improvements in the behavior and discharge rate of hospitalized schizophrenics, many of whom were chronics. This is not surprising in light of the findings of this study, which indicate that many patients, despite depressed behavior profiles, do verbally condition and seem highly conditionable overall.

It is questionable whether implications for verbal psychotherapy can be drawn for conditioners from the findings of this study, since the Taffel (1955) verbal conditioning procedure used is more structured and authoritative than most types of verbal psychotherapy. As some of the free-verbalization verbal conditioning procedures more closely resemble psychotherapy than the Taffel, replication of the results of this study on some of these procedures seems necessary for making inferences for psychotherapy with some confidence about verbal conditioning schizophrenics.

For patients such as the nonconditioners and, perhaps, especially the negative conditioners, treatment emphasis different than those posited for the conditioners might be indicated. For these patients (bearing in mind the above caveat of the limited generalizability of the results for verbal psychotherapy), it seems appropriate to wonder about the effectiveness of verbal techniques, including psychotherapy, especially when coming from a staff member. Since many of these patients may be struggling hard to reject an identity as a mental patient and get out of the hospital, they may perhaps be unnecessarily negative and hostile to the staff who are perceived as symbols of a process which they find humiliating, degrading and destructive to themselves. Whereas staff should be helped to avoid dislike and punitiveness towards these patients, it may well be best that staff involvement with and dispensing of social reinforcement

to these patients be carefully gauged and perhaps limited at times allowing the patient more choice in determining distance between himself and the staff member. Emphasis on patient therapy groups, with relatively passive and nondirective staff leadership, might also be helpful. Certainly the encouragement and reward of regular working habits and leaving the hospital as often as possible seems desirable, since the nonconditioning and negative conditioning schizophrenics manifest social and functional skills. One might suspect that it is not uncommon that staff dislike, focused upon a patient's hostile and even at times bizarre verbal content, results in his being kept on wards and at minimal activity levels. Therefore his social and functional skills deteriorate by virtue of disuse, when he could be improving them in occupational therapy in or out of the hospital, work around the hospital, sports, etc., all of which would put him in contact with other people and bring him more social reinforcement.

## Suggestions For Further Research

Further research might profitably expand the findings of this study and confirm and extend the inferences based on these results. It has been suggested here that schizophrenics who verbally condition are more "conditionable" overall. This conceptual label was inferred from their experimentally observed behavior patterns, which highly resemble behavior

patterns that hospitalization tends to condition in patients. As such, it is only an inference. One test of this supposition might be the comparison of verbal conditioners and nonconditioners on established classical and operant conditioning procedures. The ward behaviors of those who condition on the laboratory tasks could also be compared with the behaviors of those who do not. The dependent measure correlated in this study with verbal conditioning was ward behavior. This measure was selected in the hope that the comprehensive, detailed and objective information about patients it would reveal would be helpful (1) in giving a better understanding of how conditioning and nonconditioning schizophrenics behave in their environments, (2) in learning more about the characteristics of conditioners and nonconditioners, we may be in a better position to suggest directions and hypotheses for further research into the process and meaning of verbal conditioning with the schizophrenic. With regard to (2), the findings of this study have suggested that responsivity to social reinforcement is extremely important. Consequently, it would seem that research should be directed toward the investigation and elucidation of the role of social reinforcement in the verbal conditioning of the schizophrenic. It would appear important to vary the type of reinforcer and mode of its administration (i.e., verbal versus nonverbal, reward versus punishment, administration by people or machines). This

might better clarify the role and importance of social reinforcement in different types of schizophrenic patients.

Although high responsivity to social reinforcement has been hypothesized as a significant parameter of verbal conditioning, there may be other variables, particularly those operative within the conditioning situation, which may account for the performances of the subjects on the verbal conditioning. The schizophrenics who did not positively condition may not have done so because of a negative reaction to qualities of the tester or the testing situation. Since, however, these same subjects, although getting more social reinforcement from the hospital staff than the conditioners, do not seem very influenced by it, it seems equally likely that it is not the tester who was rejected as much as the social reinforcement he provided as the reward. This situation might be better clarified by research investigating the subject's perception of the conditioner and the conditioning situation. Procedures such as the Q-Sort and Semantic Differential based on the conditioner and on the task might be administered to ascertain how these perceptions correlate with verbal conditioning and ward behavior performance. Questions to be answered might be: are the situation and the conditioner perceived as likeable or unlikeable, "giving" to the subject or remaining distant from the subject, forced on the subject or not? What are the subject's attitudes towards a task perceived as forced

upon him or "giving" to him? What are his reactions towards a conditioner perceived as giving or ungiving, warm or cold?

The possibility also exists that schizophrenics who did not condition were less involved in the task; motivation and/or attention being poor. Such an explanation, however, does not preclude the importance of the proposed hypothesis of high responsivity to social reinforcement. This is because it could be argued that motivation and attention were not high because the reward of social reinforcement was not sufficiently powerful to motivate those subjects who did not positively condition. The motivational hypothesis can also be questioned in light of the observation that nonconditioning and negative conditioning schizophrenics seemed to be more involved in the objects, people and tasks in their environment. Following this line of reasoning, they would seem to be at least as likely to become involved in the intellectual task of verbal conditioning. However, this is only speculation and further research is required. Again, the subject's perception of the task could be investigated by means of procedures such as the Q-Sort and Semantic Differential, with a view towards discovering how likeable or unlikeable, interesting or uninteresting, the task was. Attentional variables seem somewhat more difficult to measure and meaningfully correlate with performance on verbal conditioning, although it might be interesting to discover how reaction time (measured from time of card presentation

to time of beginning of sentence formation), or amount of eye contact towards the conditioner or the stimulus cards correlated with verbal conditioning performance.

## Final Comments

Research similar to that outlined above might well prove fruitful for a fuller understanding of the variables operating in the verbal conditioning and perhaps other types of conditioning of the schizophrenic. It is felt that this is of importance since much of the conditioning that the schizophrenic undergoes within the hospital is of dubious effectiveness. Better understanding of the variables operative in the conditioning of different types of schizophrenics may well help in the determination of the most effective modes of treatment for each type. In this vein, it is hoped that the findings of this study will help dispel further the notion that schizophrenics are uninfluenceable and ultimately, untreatable, due to an innate schizophrenic deficit. On the contrary, many schizophrenics, including chronics, do condition quite effectively. This suggests that just as with normals more attention be paid to the stimuli and reinforcements that control the schizophrenic's behavior.

## SUMMARY

The overt ward behaviors of forty hospitalized male schizophrenics who previously had been administered the Taffel verbal conditioning procedure were observed and recorded. It was predicted that schizophrenics who positively verbally conditioned would show more of a depressed behavior profile than those who did not condition. Three experimental groups were formed: (1) conditioners: Ss who positively verbally conditioned; (2) nonconditioners: Ss whose criterion verbal rates did not differ from their operant verbal rates; (3) negative conditioners: Ss whose criterion verbal rates were significantly lower than their operant rates. As predicted, conditioners showed significantly more Social and Functional (active behaviors using the objects and resources of the ward) behaviors and significantly less Null (inactive) behaviors than the nonconditioners, negative conditioners, or these two latter groups combined. The depressed behavior profile manifested by the conditioners is what previous researchers have thought to be the result of hospital conditioning upon patient ward behaviors. Consequently, a hypothetical positive correlation was drawn between verbal conditionability and overall conditionability in schizophrenia. The findings of this study also suggested that responsivity to social reinforcement is a key variable underlying the schizophrenic's performance on verbal conditioning.

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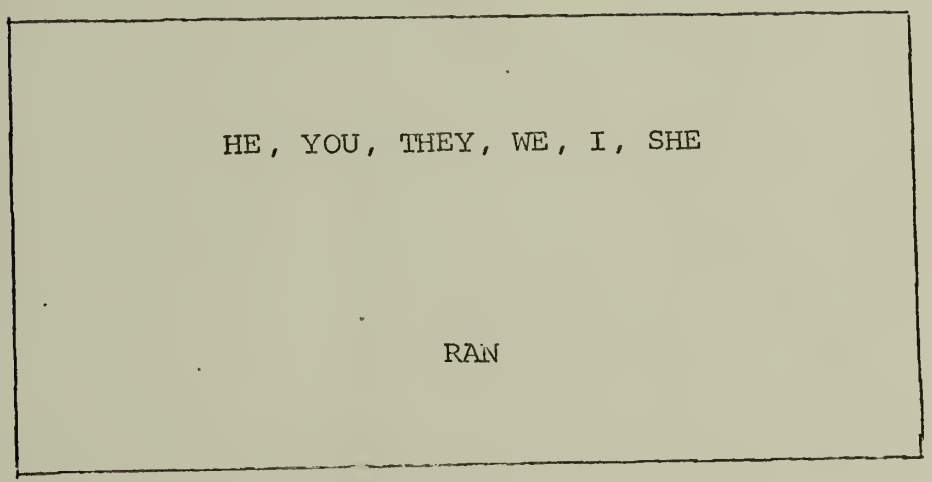
# APPENDIX 1

## Sample Taffel Verbal Conditioning Stimulus Card




The subject is handed the card and asked to make up a sentence using the word on the bottom of the card and beginning with any of the words on top of the card.