EFFECTS OF THREE CONDITIONS OF REINFORCEMENT ON THE
PERFORMANCE OF THREE LEARNING TASKS BY
HOSPITALIZED CHRONIC SCHIZOPHRENICS

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EFFECTS OF THREE CONDITIONS OF REINFORCEMENT ON THE PERFORMANCE OF THREE LEARNING TASKS BY HOSPITALIZED CHRONIC SCHIZOPHRENICS

DISSERTATION

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By

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CHAPTER I

INTRODUCTION

On February 5, 1963, the late President John F. Kennedy urged a reorientation in the direction of mental health services. Within a year, the Eighty-Eighth Congress passed Public Law 88-164. This act provided for the construction of community mental health centers (49).

Federal funds were available for community mental health centers if they provided a minimum of five essential services: inpatient services, outpatient services, partial hospitalization, emergency twenty-four-hour services in at least one of the preceding services, and consultation and educational services to community agencies and professional personnel.

In addition to these essential services, and adequate center would also include diagnostic services, rehabilitative activities such as vocational and educational programs, pre- and aftercare services, training services, and research and evaluation.

Barnes (4, p. 157) has proclaimed that "the future of the community mental health center turns on its capability for dealing with the long-term patient." Pasamanick, Scarpitti, and Dinitz (35) have estimated the current mental hospital population to be 530,000 with 45 per cent of the
patients in continuous residence for ten years or more. They found the average length of hospitalization for schizophrenics to be eleven years. In spite of the difficulties imposed by such a large mental hospital population, the objective of community mental health centers has been to reduce the present hospital population and prevent unnecessary new admissions.

The task of reducing the mental hospital population has been arduous. Indeed, the majority of the 45 percent of patients that were designated as being in continuous residence for ten years or more were chronic schizophrenics. This has made the task of developing rehabilitative programs exceedingly difficult. As Lindsley (26, p. 67) has noted, "the chronic psychotic has a maximized form of psychosis and the lowest probability of changing . . . ." Research in the area of rehabilitative services for the acute and long-term patient has focused on providing vocational and home-care services. Pasamanick et al. (35) noted that research in this area has been effective in preventing hospitalization, but has not contributed to the reduction of the current hospital population.

Typically, hospital programs designed to place the long-term patient in a community setting have involved a "phasing-out" process (19). The first step in this process has been to evaluate a patient's eligibility for a rehabilitation program. Evaluation has consisted of administering a battery
of psychological tests and obtaining subjective appraisals from hospital staff members. In many instances there were patients who, as a result of organicity or an active and severe behavior disturbance, were considered unable to function in a community setting and consequently had to remain in the hospital. Patients considered eligible for the program were placed on a remotivation unit and enrolled in available rehabilitation programs.

There has been an increasing interest in adult education as a rehabilitative service for long-term schizophrenics. Indeed, educational programs have become essential to many hospitals (19). In the past, emphasis has been on adolescent education. As Fudell (15, p. 24) has suggested, ". . . there seems to be general agreement that an education program must be provided for the children." Most children and adolescents who have been patients in a mental hospital have participated in some type of educational program. However, the use of adult education as an adjunct to therapy is a comparatively new concept in the treatment of hospitalized patients (19). Unfortunately, research concerning rehabilitative education and the adult chronic schizophrenic is nominal.

To increase the scope of current educational programs and to prepare patients for community living, the hospital staff of Big Spring State Hospital developed a program for adult chronic schizophrenics. A primary objective of the
program was to provide the patient with the resources necessary to function successfully as a member of a community. The educative process ranged from simply helping patients to learn elementary methods of coping with daily problems to teaching relatively complex academic skills.

Problems were encountered in establishing classes for these patients. The first obstacle that had to be eliminated involved the selection of teachers. Since funds were not available to hire certified teachers, unit attendants had to be trained to instruct classes. The second obstacle was patient characteristics. Typically, these patients, whose educational and literacy level was low, had been hospitalized a number of times for a period of three to twenty years. Their functional educational level varied from illiterate to as high as the twelfth grade, which created problems in grouping and curriculum development. It was found that patients did not accept a change in routine; they feared the proximity to others in a classroom situation, especially when unfamiliar patients were in the group.

An even greater problem in establishing classes for these patients was the concept of psychological deficit. Hunt and Cofer (20, p. 971) have defined this phenomena as "... performance at a level of efficiency below that expected from typical individuals." They further stated that deficit performance was not an irreversible process such as in the case of mental retardation or a chronic brain
syndrome. Many studies have attempted to compare a schizophrenic's performance on task variables, contingency of reinforcement, nature of the reinforcement, and reinforcement paradigms. Silverman (43) and Johannsen (22), in reviewing the literature on the above mentioned variables, often found contradictory results.

The studies to date have typically reported the type or types of reinforcement that reduce deficit performance in schizophrenics, focusing on comparing verbal and non-verbal forms of positive and aversive reinforcement. Johannsen (22), in summarizing the literature, noted that punishment, either verbal or nonverbal, usually resulted in improved performance. However, studies like that of O'Brien and McCarthy (32) have shown that the superiority of punishment over reward disappeared when the schizophrenic subjects did not immediately receive full information on how to avoid future punishment. The literature reviews have shown the relationship between schizophrenic deficit and reinforcement to be complex and lacking in clarity (22, 43).

The rehabilitative education program for adult chronic schizophrenics at Big Spring State Hospital is presently being studied and revised. At this time, the hospital staff has not employed a reinforcement paradigm as a part of their educational program. It is the purpose of this study to determine whether or not an organized system of reinforcement would be the assistance attendants need to improve patient performance and promote acceptance of new experiences.
Statement of the Problem
This study is concerned with determining the relationship among functional educational level of groups, three types of reinforcement, and length of the study and with their resulting effects on schizophrenic performance.

Hypotheses
The following hypotheses were tested:
I. There will be a significant interaction between functional educational level of groups and conditions of reinforcement.

II. All subjects will score significantly higher on the learning tasks under the condition of aversive reinforcement than under the condition of positive or neutral reinforcement.

III. All subjects will score significantly higher on the learning tasks under the condition of positive reinforcement than under the condition of neutral reinforcement.

IV. There will not be a significant interaction among functional educational level, conditions of reinforcement, and length of study.

Definition of Terms
1. **Functional educational level of groups.** As used in this study, functional educational level of groups was defined as a subject's current level of performance on educational tasks as measured by the *Wide Range Achievement Test*,
Wechsler Adult Intelligence Scale, and subjective appraisal by the hospital staff.

2. **Achieved educational level.** As used in this study, achieved educational level was defined as a subject's highest achieved level of formal education. This information was derived from subjects' case histories.

3. **Neutral reinforcement.** As used in this study, neutral reinforcement was defined as a condition of reinforcement that held no positive or aversive value for any subject.

4. **Positive reinforcement.** As used in this study, positive reinforcement was defined as any one of the sixteen items selected and received by a subject who correctly answered eleven of fifteen questions on the learning tasks.

5. **Aversive reinforcement.** As used in this study, aversive reinforcement was defined as a subject being restricted from all canteen privileges for not correctly answering eleven of fifteen questions on the learning tasks.

6. **Unit staff member.** As used in this study, a unit staff member was defined as being any staff member employed on the unit where the study was conducted. This included a unit director, attendants, registered nurses, and psychologists.

7. **Remotivation unit.** As used in this study, a remotivation unit was defined as a hospital unit where rehabilitatively eligible chronic undifferentiated schizophrenics
8. **Organized system of reinforcement.** As used in this study, an organized system of reinforcement was defined as consistently using one or a combination of types of reinforcement to modify the behavior of chronic undifferentiated schizophrenics.

9. **Good or poor premorbid schizophrenics.** As used in this study, a good or poor premorbid schizophrenic refers to a schizophrenic patient whose social and personal adjustment was either "good" or "poor" prior to onset of illness and hospitalization.

**Limitations of the Study**

This study is limited to hospitalized chronic schizophrenics from Big Spring State Hospital, Big Spring, Texas.

**Related Literature**

The review of related literature is presented in terms of the social motivational view of schizophrenic deficit, and is discussed in three sections---(1) the social censure hypothesis, (2) the affective stimulus hypothesis, and (3) the insufficient motivation hypothesis.

**Social Motivational View of Schizophrenic Deficit**

Three opposing hypotheses have been formulated to account for the social motivational view of schizophrenic deficit. They were the social censure hypothesis, the
affective stimulus hypothesis, and the insufficient motivation hypothesis.

Rodnick and Garmezy (39) have been the most adamant supporters of the social censure hypothesis. In reviewing psychiatric reports of clinical investigations, they noted many instances where the schizophrenic was oversensitive to social criticism. It seemed that this heightened sensitivity increased the schizophrenic's inability to differentiate cues in his environment which resulted in a deficit performance. From this observation, it was proposed that the introduction of censure would produce greater discrimination decrements in schizophrenics than in normal individuals. Garmezy (16) tested the hypothesis that schizophrenics would have greater difficulty in responding differentially to stimuli along a given dimension than would non-psychiatric individuals. It was also hypothesized that the introduction of social punishment for incorrect responses would produce even more marked differences in the differentiating ability of schizophrenic and normal subjects. Experimental findings revealed that when the word "Wrong" (social censure) was flashed after a response, schizophrenics made more errors and had flatter generalization gradients than after the word "Right" (praise) was flashed after a response. He stated, "Learning curve data indicated that under the threat of punishment, avoidance responses to all stimuli came to dominate the behavior of the schizophrenic patients,"
overshadowing and negating previously effective reward" (16, p. 275). However, the normal subjects profited considerably from additional cues resulting from social punishment for incorrect responses.

Using normal subjects, schizophrenics with good premorbid adjustment, and schizophrenics with poor premorbid adjustment, Alvarez (1) examined the effects of censure on subjects' judgments of pictures. Censure (wrong) and praise (right) were administered to the subjects' judgments and their later preferences for the same pictures were assessed. The results indicated that poor premorbids were more sensitive to censure than good premorbids or normals; that is, the poor premorbids showed the greatest decline in preference for the pictures associated with censure. Similar results have been reported by Neiditch and Zahn. Neiditch (30) found functional psychotics had a significantly lowered preference than normals for tasks which followed a failure situation. Zahn (50) compared good and poor premorbid schizophrenics on their size estimates of pictures which denoted scolding and feeding of a child by a mother. The size estimates were rewarded (right) for some subjects and punished (wrong) for others. Good premorbid schizophrenics tended to over-estimate the size of the punished pictures, whereas normals and poor premorbids did not. He interpreted the results in terms of a high degree of anxiety or affective responsivity in the good premorbids and the predominance of avoidance and withdrawal mechanisms in the poor premorbids.
Many of the experiments attempting to offer support for the social censure hypothesis have been subjected to a variety of interpretations. Buss and Lang (7) reported that the evidence for the social censure hypothesis has been inconclusive, with the only significant finding being that censure seemed to affect schizophrenics with poor premorbid adjustment more than schizophrenics with good premorbid adjustment.

The concept of censure stimuli has been investigated as a corollary to the social censure hypothesis. It has been hypothesized that stimuli connoting parental punishment or negative parental figures would result in heightened sensitivity in schizophrenics. In an attempt to confirm this hypothesis, Baxter and Becker (5) compared good and poor premorbid schizophrenics on anxiety level, using Thematic Apperception Test cards depicting mother-son and father-son relationships as the criterion measure. It was found that good premorbid scored high on anxiety when the father-son pictures were presented, whereas the poor premorbid manifested the greatest amount of anxiety to the mother-son pictures. However, the interpretation of results was confounded because the schizophrenics with good premorbid adjustment scored about the same in anxiety on both pictures and there was no control group of normal subjects. Hence, there was no way of assessing how much anxiety ordinarily appears in stories about these pictures.
In a similar experiment, Lebow and Epstein (25) investigated what they coined as "goodness of response." Good premorbid schizophrenics and medical patients told stories about Thematic Apperception Test cards depicting mother, father, and peer interactions in nurturant, rejecting, and ambiguous situations. These authors found that schizophrenics had a strong tendency to tell their poorest stories to the nurturant cues and their best stories to the ambiguous cues, finding nurturant as well as rejecting cues disruptive. It was concluded that rather than a specific censure-cue deficit, schizophrenics seemed to exhibit a general deficit for cues associated with emotional involvement, whether of a positive or negative nature.

In evaluating the research on deficit and stimuli connoting parental censure, Buss and Lang (7) found that the studies did not always support the censure hypothesis. In fact, schizophrenics were affected not only by parental censure but also by stimuli connoting affection and approval.

A number of studies have attempted to show that schizophrenics were oversensitive to all affective stimuli, not merely censure stimuli. Ehrenworth (14) had schizophrenics and normals judge the size of drawings of geometric figures as well as the size of drawings denoting affective themes such as heterosexuality, autonomy, competition, affiliation, and authority. An analysis of the results revealed that schizophrenics' size estimates of the affective stimuli were
significantly poorer than their estimates of the geometric figures and normals' estimates of the affective stimuli. Similar studies have reported significant results using the human versus nonhuman stimuli dichotomy. Davis and Harrington (12) compared schizophrenics and normals on two conceptual discrimination tasks, one utilizing nonhuman stimuli and one using human stimuli. It was found that when human stimuli were introduced, the schizophrenic's performance was severely disrupted.

Arey (2) evaluated schizophrenics for recognition of sexual and neutral pictures. He observed that schizophrenics' recognition performance on sexual pictures was significantly poorer than normal subjects' as compared to nonsexual pictures. In addition to the experiments previously reviewed, several studies have attempted to demonstrate a difference in perception between schizophrenics and normals. However, Nelson and Caldwell (31) investigated depth perception in normal subjects and schizophrenics using stimulus drawings of a dog, a circle, a man, and a woman and found that schizophrenics did not differ from normals in perception for different stimuli.

The above research has indicated that schizophrenic deficit occurs in response to many different kinds of affective stimuli, not merely those of a censuring nature. Unfortunately, these findings have not led to a refinement of the schizophrenic deficit dilemma. As Buss and Lang (7, p. 7)
have suggested, "the central problem is to define the term affective, whose meaning appears to change from one experiment to the next . . . in the face of such diverse operational definitions, it is difficult to maintain a clear referent for affective stimuli."

In an attempt to justify the conflicting results of the above mentioned studies, Buss and Lang (7) proposed that human, sexual, symbolic, and aggressive stimuli elicited more mental associations than did neutral stimuli. These additional associations resulted in a performance deficit. A later study by Deering (13) lent support to the multiple association concept of Buss and Lang. He had subjects associate to pleasant and unpleasant affective stimuli and to neutral words, which were matched for familiarity. He noted schizophrenics had significantly more associations to affective words than did normal subjects but that neither group differed in the number of associations to neutral words. From these findings, it was concluded that the greater the number of associations to any stimuli, the more the subject would be distracted and the more his performance would suffer.

The literature has depicted the schizophrenic as being unmotivated in experimental situations, whereas the normal subject has been noted for his attempts to please the experimenter (7). Slechta, Gwynn, and Peoples (44) found that normal subjects yielded a significantly greater percentage of responses than did schizophrenics when subtle social
reinforcers, such as a smile or a nod of the head, followed a subject's verbal behavior. Similar findings (34) led to the formulation of the insufficient motivation hypothesis. Where the social censure hypothesis assumed schizophrenic deficit was the result of sensitivity to rejection, the insufficient motivation hypothesis assumed that deficit was due to a lack of motivation, not a lack of ability.

Investigations attempting to validate the insufficient motivation hypothesis have been varied, but for the most part attention has focused on the verbal and nonverbal forms of positive and aversive reinforcement. Early studies made the assumption that a schizophrenic's performance would approximate that of normal subjects under conditions of urging or punishment. Stotsky (45) proposed that schizophrenics' performance would improve if they were given a motivational incentive. His study showed how regressed schizophrenics and normal subjects compared on psychomotor performance, with schizophrenics receiving an incentive from their psychotherapist and normals receiving an incentive from the experimenter. Both groups were responsive to the motivational incentive, with the schizophrenic group manifesting the greatest improvement in simple reaction time. In a related study by Olsen (33), schizophrenics' performance on a digit symbol task improved following praise or punishment, whereas normal subjects improved only after praise. However, D'Alessio and Spence (11) compared normals and chronic
schizophrenics on a simple motor task and found no significant differences.

The ambiguous and often contradictory results of studies investigating schizophrenic performance and subsequent improvement under positive or negative instructions have not supported a motivational interpretation of deficit. Research has shown that schizophrenics, normals, and brain-damaged subjects (42), improved equally under urging conditions. In fact, one study (24) found urging to be totally ineffective in modifying schizophrenic psychomotor performance.

Johannsen (22, p. 855), in his review of motivation and schizophrenic performance, observed that, "in the area of nonverbal forms of reinforcement, very few researchers have examined the effect of positive incentives." Peters (37), in one of the few studies employing positive incentives, induced a sugar deficiency in chronic schizophrenics and used fudge as a positive reinforcement for correct responses on a gradated series of motor problems. The results indicated that operant rate increased with reward, but it did not decrease the number of errors. In a related study, Peters and Jenkins (38) hypothesized that rewarded achievement on simple motor tasks would provide a basis for success in more complex social tasks. If the subjects were able to meet success in more complex tasks, then hopefully the experimental behavior would transfer to everyday behavior. They observed that the experimental group had significantly fewer
behavioral incidents, but unfortunately the ratings of ward personnel did not distinguish between the groups. Implementing a positive incentive, Burday (6) compared brain-damaged, non-psychiatric, and schizophrenic patients on a conceptual sorting task. The subjects were promised money for good performances, but this incentive failed to produce significant differences among the groups.

Operant conditioning has served as a framework for several studies involving nonverbal positive reinforcement. In these types of studies, reinforcers such as candy, cigarettes, and money were found to be successful in reducing the performance deficit of schizophrenic subjects (27). Operant conditioning has also been used to increase responsiveness in severely regressed schizophrenics. Tilton (47) found that chronic schizophrenics' general level of functioning could be raised through instrumental conditioning. In spite of the dramatic behavioral changes reported by adherents of operant conditioning, issue has been taken with their conclusions.

Contrary to those studies advocating the use of nonverbal rewards, Killberg (23) found that schizophrenics and normals did not differ on a verbal learning task when cigarettes were used as a reinforcer. Similarly, Topping and O'Connor (48) reported that monetary reward improved the performance of controls on a serial anticipation task, but that paranoid schizophrenics worsened under the same conditions. The majority of studies examining nonverbal reward
have failed to reveal any consistent evidence that, for schizophrenics, positive tangible rewards were superior to verbal reinforcement. It was also noted that the results of these studies appeared to fluctuate with changes in population and experimental setting.

In an attempt to provide consistency to the literature regarding nonverbal positive and aversive reinforcement, McInnis and Ullman (29) compared short- and long-term schizophrenics in a probability learning situation. Groups of forty long-term and forty short-term schizophrenics were randomly assigned to positive and negative extrinsic reinforcement conditions. Personality variables such as neuroticism, extroversion, paranoia, and the process-reactive classification were assessed in order that they could be correlated with responsiveness to positive or negative reinforcement. The hypothesis that short-term schizophrenics were more responsive than long-term schizophrenics was supported. A significant interaction was found, indicating positive and negative reinforcement were differentially effective for both short- and long-term schizophrenics. An interesting finding was that long-term subjects' responsiveness under positive reinforcement increased during the last 40 of 200 trials. However, it was not possible to determine if the long-term subjects would have eventually stabilized at a level not significantly different from the other groups. The authors reasoned that, "although a major hypothesis of
this study involved decreased responsiveness as a result of
the psychiatric hospital experience, it also seems reasonable
to hope that hospitalized schizophrenics can be restrained
and become increasingly responsive to positive reinforcement" (29, p. 161). Although this investigation attempted to
solidify past research, many questions remained unanswered.

In contrast to nonverbal reward, aversive nonverbal
reinforcement has proven to be a consistent behavioral
modifier of schizophrenics. Paschal and Swenson (36), in
their pioneering study of learning under unusual motivation,
observed a lack of difference between normals and schizo-
phrenics on the initial trials of a discrimination reaction
time task. However, on subsequent trials it was noted that
normal subjects improved where the schizophrenic group did
not. At this point, blasts of 116-dbs. white noise, which
required a correct response in order to be terminated, were
introduced through earphones. It was found that all subjects
improved, with schizophrenics exhibiting a greater reduction
in reaction time than was observed in normal subjects. In
the final analysis, it was discovered that schizophrenic
performance was no longer significantly different from the
performance of normal subjects.

Rosenbaum, Grisell, and Mackavey (40) found that schizo-
phrenic performance could be improved under conditions of
electric shock. They compared the reaction times of male
schizophrenics, female schizophrenics, and hospital employees
on a simple finger reaction in response to an auditory stimulus and found that the reaction time of hospital employees was significantly faster than the schizophrenics under all experimental conditions. However, schizophrenics improved significantly over the normals from nonshock to shock conditions. Using a different ask variable, Cavanaugh (8) investigated the effects of aversive reinforcement on a concept formation task. Chronic schizophrenics and non-psychiatric subjects were compared and it was observed on the initial trials that schizophrenic subjects were inferior, but with the introduction of a high intensity noise the schizophrenic group had significantly more correct responses and reduced latency scores. In the final analysis, the schizophrenic group did not differ from the similarly treated non-psychiatric group.

The phenomena responsible for the decline in deficit when noxious stimuli were introduced has been argued from several theoretical positions. Paschal and Swenson (36) interpreted their results in terms of stress of a greater magnitude being substituted for that pre-existing in the schizophrenic condition. Interference was the interpretation Buss and Lang (7) advocated. They felt a significant change in attention occurred with the introduction of the aversive stimulus enabling schizophrenics to distinguish between relevant and irrelevant environmental cues which led to performance at a higher level of efficiency.
The effectiveness of nonverbal forms of reinforcement has been investigated through various paradigms, each producing its own interpretations and artifacts. Studies have not shown nonverbal positive reinforcement to be an effective and consistent modifier of schizophrenic behavior, but many facets of nonverbal reward remain to be investigated. Nonverbal punishment has proven to be an effective and consistent form of reinforcement. These results, along with experimental designs, have been subjected to several theoretical arguments. In spite of the various interpretations of results, researchers like Johannsen (22) have stated that this phenomenon is worthy of more intensive investigation.

The literature abounds with studies that have been designed to determine the differential effects of verbal reward and punishment on schizophrenic deficit. The experimental paradigm, which was originated by Greenspoon (18), has remained relatively the same throughout these studies. Ordinarily, reinforcement would follow a schizophrenic's performance, then criterion scores were obtained from subsequent performance on an equivalent task. The effects of reinforcement were then inferred from the degree of change between initial performance and the second measure of performance.

Implementing Greenspoon's technique, Taffel (46) divided undifferentiated psychiatric subjects into three groups of low, medium, and high anxiety. A stimulus card bearing six
pronouns was presented to the subjects eighty times with the examiner systematically responding with the word "good" when subjects responded to pronouns of self-reference. The verbal reinforcer proved to be more effective in the high and medium anxiety groups than in the low anxiety group. In a related study, Cohen and Cohen (10) divided their subjects on the basis of diagnostic classification and discovered that the neurotics' performance was facilitated by the word "good" being presented after the first and third person pronoun responses. However, the schizophrenic group did not improve, and the authors attributed their lack of improvement to their insensitivity to verbal cues which normally function as positive reinforcers.

Randomly dividing chronic schizophrenics into two punishment groups, two reward groups, and a control group, Atkinson and Robinson (3) administered a paired-associates learning task. The following reinforcers were used: the punishment groups were told they would receive verbal censure or the sound of a machine when they made an incorrect response, the reward groups were told they would receive either a verbal reward or the sound of a machine following a correct response, and the control group received no reinforcement at all. Results indicated "that the two punishment groups were clearly and significantly different from the control group and the two reward groups, but very similar to each other" (3, p. 324). Several meaningful conclusions
were reported by the authors: (1) mild punishment (personal or impersonal), for incorrect responses or failures to respond, was more effective than mild reward (personal or impersonal) in facilitating learning by schizophrenics, with normals learning more rapidly under conditions of mild reward; (2) analysis of errors suggested that punishment may have broken perseverative tendencies, which improved performance; (3) reward, as used in this study, did not function as a positive reinforcement in the sense of increasing the probability of response; and (4) there were no significant differences between the two forms of punishment, however the personal reward groups' learning improved more than the impersonal reward groups'. Atkinson and Robinson made a valuable observation at the completion of the study, stating that

... hospitalization is not aimed at producing rapid learning, as such, but rather with getting people well... perhaps getting well for the schizophrenic involves reorientation with respect to those reinforcers which are effective and his developing the ability to seek rewards and avoid punishment in a constructive manner (3, p. 325).

Goldman substantiated the above findings in a similar experiment. Male chronic schizophrenics were divided on the basis of their anxiety level in contrived dependency situations. The task and reinforcement paradigm was essentially the same as in the Robinson study. The author noted that rewards were least effective for high-dependency anxious subjects, with punishment initially leading to progressive
improvement. However, punishment disrupted performance in the low-dependency anxious group with the greatest improvement occurring under conditions of reward and non-reinforcement.

Losen (28) was interested in determining the differential effects of partial reinforcement and continuous reinforcement upon mathematical reasoning. Schizophrenics with good premorbid adjustment and normal subjects were matched on the basis of arithmetic ability, and assigned to four experimental conditions. The four experimental conditions were as follows:

(1) 100% censure—the examiner criticized subjects after every incorrect response on a 20-problem arithmetical-reasoning task (2) 50% censure—the same procedure was involved for every other error made by a subject (3) 0% censure—no comments were made concerning the subject's errors (4) information—upon completion of each task item, the subject was shown the correct solution (28, pp. 258-272).

None of the experimental conditions significantly altered the performance of normals. However, schizophrenics in both the 100 per cent and 50 per cent censure conditions made significant improvements in performance, where the 0 per cent and information conditions did not result in improved performance. Post-experimental interviews with the schizophrenics revealed that they perceived the censure to be helpful.

The social censure hypothesis that Garmezy and Rodnick investigated was not supported by the above series of studies. Instead of censure disrupting performance, both verbal
censure and physical punishment for errors led to a signifi-
cant improvement in performance. In addition, several

studies supported the view that the ameliorative effects of
censure were not due to the personal or social character of
the reinforcers. Atkinson and Robinson (3) did not find a
significant difference between the effects of the sound of
an adding machine and verbal censure on performance. Other
studies (22, 41) have also shown that the personal or social
character of reinforcement was not significantly different
from neutral reinforcers.

It can be noted from the previously reviewed research
that the effects of punishment have been inconsistent.
Under certain experimental conditions punishment disrupted
performance, while other paradigms revealed punishment to be
facilitating. These findings have led researchers to hypoth-
esize that the interpersonal contact of reinforcements was
not as meaningful as information about inadequate responses.
Normal subjects have been known to profit from knowledge of
results because it confirmed the appropriateness of a
response, or it indicated the need for a change, while
schizophrenics seemed to lack the self-instructing qualities.
In support of this observation, Shakow (41) found that
schizophrenics were unable to maintain or usefully alter a
response set. It has been further demonstrated that schizo-
phrenics cannot observe relationships unless their attention
has been specifically cued in that direction. From these
studies, it can be observed that informational cues have a significant effect on some psychotics' performance. These findings led Buss and Lang (7, p. 12) to advocate that "the separation of censure from information about errors should be part of any experiment on verbal punishment and deficit."

Summary

Attempts to validate the social motivational view of schizophrenic deficit seemed to have faltered, despite the intense interest and voluminous investigatory work. It has been said by various authors that many of the unfertile attempts were the result of differing reinforcement paradigms, inappropriate tasks, subject selection procedures, reinforcement value, and a host of other variables too numerous to mention. It was demonstrated that certain types of censure stimuli were capable of producing schizophrenic deficit, but for the most part, the censure hypothesis seemed to be incorrect (7). One of the few significant findings was that censure seemed to affect poor premorbid schizophrenics more than good premorbid schizophrenics. The related hypothesis that stimuli connoting parental punishment or negative parental figures would result in deficit due to increased sensitivity was only partially substantiated. In fact, schizophrenics responded to stimuli connoting affection and approval as well as parental censure. The findings indicating that schizophrenics were responsive to all affective
stimuli led to the formulation of the affective stimuli hypothesis.

In many instances, the affective stimuli hypothesis was researched by having subjects estimate the size of drawings of geometric figures, human-non-human stimuli, and affective stimuli. Several experimental findings supported the affective stimuli hypothesis, but generalizations were difficult to make because the term "affective" had been so loosely used. The concept of affective stimuli seemed to change from experiment to experiment, ostensibly disregarding the need for a concise operational definition. Nevertheless, a promising hypothesis evolved from the research on affective stimuli. It was proposed that affective stimuli were capable of eliciting more mental associations than were neutral stimuli. Presumably, the more mental associations a certain stimulus elicited the more a subject's performance would suffer.

The insufficient motivation hypothesis evolved from observations of schizophrenic behavior in experimental settings. Some investigators had noted that the schizophrenic was characteristically uncooperative and did not demonstrate a desire to participate in research. It was recognized that the schizophrenic was oversensitive to rejection, but it was hypothesized that deficit was primarily due to a lack of motivation, not a lack of ability.
Research focused on the effects of general urging instructions, nonverbal positive and aversive reinforcement, and verbal positive aversive reinforcement on schizophrenic performance. In the beginning it was believed that a schizophrenic's performance would approximate that of a normal subject's if he were given a motivational incentive, which usually took the form of encouragement or punishment. These studies yielded ambiguous and contradictory information, revealing that subjects, regardless of classification, improved equally under urging conditions.

Nonverbal positive and aversive reinforcement studies yielded what could be called certain trends in behavior. Evidence seemed to indicate that nonverbal positive reinforcement was not superior to verbal reinforcement and that the value of a particular nonverbal reward for any subject was difficult to determine. The overall effectiveness of nonverbal positive reward on schizophrenic deficit was found to be inconsistent. However, Johannsen (22) noted that researchers had not fully examined this variable and suggested it was worthy of more investigation. In contrast to the inconsistencies of nonverbal positive reinforcement, nonverbal aversive reinforcement proved to be a reliable modifier of schizophrenic behavior. The use of aversive stimuli such as intensive noise and shock often caused a schizophrenic's performance to improve and equal that of normal subjects. Several interpretations attempted to account for the sudden improvement resulting from the
introduction of noxious stimuli. One of the most promising
was the proposition that a significant change in attention
occurred with the onset of aversive stimuli which enabled
schizophrenics to attend only to those task stimuli that
were relevant.

The research that dealt with verbal positive and
aversive reinforcement was not as concerned with eliminating
schizophrenic deficit as determining the differential
effects of reinforcement. The ameliorative effects of verbal
positive reinforcement were found to be dependent on factors
such as personality variables, task difficulty, and how it
was used in conjunction with verbal aversive reinforcement.
Verbal reward did improve schizophrenic performance, but it
usually was not as effective as aversive reinforcement.
Atkinson and Robinson (3) offered a seemingly valid observa-
tion when they stated that a schizophrenic was not oriented
to those reinforcers which were essential to his developing
the ability to seek rewards and avoid punishment.

Verbal aversive reinforcement was found to be effective
in facilitating schizophrenic performance which contradicted
the social censure hypothesis that Rodnick and Garmezy (39)
investigated. There was evidence that indicated the facili-
tating effects of punishment were due to a shift in set or a
breaking-up of perseverative tendencies. On the other hand,
several investigators hypothesized that the effects of
censure were not the result of personal or social character-
istics of the reinforcers, but that the knowledge of results
provided by censure served to guide the subjects' subsequent behavior.

Although the varied research findings on the social motivational view of schizophrenic deficit have left many significant questions unanswered, the inconsistencies seem to have provided a trend. In the past, it has been advocated that variables such as reinforcement paradigms, task difficulty, subject selection, knowledge of results, and numerous others be part of any experiment. The objective in previous research has been to account for these variables, but apparently only in a singular fashion. It would seem that the pursuit of reducing schizophrenic deficit would first involve a defined objective and secondly an attempt to account for significant variables and how they interact with one another. The previously reviewed research clearly indicated that there were many definitions of deficit and its related variables. The task for future investigation would appear to be one of comparing possible interactions among subjects and variables, not merely how each variable singularly affects performance.
CHAPTER BIBLIOGRAPHY


CHAPTER II

METHOD AND PROCEDURES

Selection of Subjects

Subjects were twenty-two female and seventeen male chronic undifferentiated schizophrenics (5). Their ages ranged from twenty to fifty years, with a mean of thirty-eight years. Length of hospitalization ranged from two to fifteen years, with a mean of seven years. Achieved educational level, as determined from patient case histories, ranged from first grade to twelfth, with a mean of the fifth grade. The severity of illness for all groups was judged by the psychology staff to be homogeneous.

Subjects were evaluated individually by the staff psychologists to determine their eligibility for enrollment in a rehabilitative education program. Eligibility was determined on the basis of the Wechsler Adult Intelligence Scale (4), the Wide Range Achievement Test (1), and a subjective clinical appraisal by the unit staff of a subject's general level of functioning. To select 39 subjects from 200 patients determined eligible, a referral on each of the 200 patients was submitted by the unit director to the remotivation unit responsible for the education program. The 200 referrals were divided into 3 groups on the basis of functional grade level. The functional grade level for Group I
ranged from first grade to fourth; the grade range for Group II was fourth to sixth; and the grade range for Group III was sixth to ninth. After each referral was assigned a number, thirteen patients were selected at random from each of the three groups using a table of random numbers. The three groups were the following:

1. Low—Thirteen subjects were in the low group. Their mean functional grade level was second grade, fifth month.

2. Intermediate—Thirteen subjects were in the intermediate group. Their mean functional grade level was the fifth grade.

3. High—Thirteen subjects were in the high group. Their mean functional grade level was the seventh grade.

Description of the Instruments

The instruments used in this study were a spelling task, a series of retention lessons, and a series of resource lessons.

A consultant from the Howard County Junior College Department of English and the unit staff from the rehabilitative program developed a spelling list for the groups. The list was constructed by selecting seventy words at random from word lists developed by Patton and Johnson (2) for seven grade levels ranging from first to seventh grade. Ten words were selected for each grade level with words corresponding to higher grade levels added to the list if a
subject correctly spelled all of the words during any educational session. An example of this task can be found in Appendix A.

A series of nine retention lessons, each consisting of five short-answer questions, was developed by the unit staff from the rehabilitative program. The purpose of the task was to test retention of specific information. The questions were taken from a government publication, Our American Way of Life (3), which was written on a third-grade reading level. Although the nature of the questions was similar on all lessons, the questions differed on each lesson. An example of this task can be found in Appendix B.

A series of nine resource lessons was developed by the unit staff of the rehabilitative program. Each lesson consisted of five short-answer questions dealing with English usage, government, and information concerning hospital personnel. The purpose of this task was to evaluate a subject's willingness to become involved in rehabilitative programs. The questions were so designed that subjects were required to leave the unit to find some of the answers. Although the nature of the questions was similar on all lessons, the questions differed on each lesson. An example of this task can be found in Appendix C.

Procedure

Nine unit staff members, three assigned to each group, were trained to administer the learning tasks, using three
conditions of reinforcement. The learning tasks were spelling lessons, retention lessons, and resource lessons. The conditions of reinforcement were neutral, positive, and aversive. Training periods for the staff members consisted of five sessions conducted by a staff psychologist. At the end of the fifth training session, each unit staff member was evaluated by a panel of judges as to his ability to administer the learning tasks using the three conditions of reinforcement. The panel of judges consisted of two registered nurses, two attendants, a social worker, and a psychologist. Unanimous interjudge agreement was reached on all trainees at the end of the fifth session and they were ready to conduct the educational programs as stated. Training sessions were then discontinued.

A list of fifty positive tangible rewards was prepared by the unit staff, from which sixteen items were selected. Each of the sixteen items selected was judged unanimously by the unit staff as having a positive reinforcement value for the subjects. The position of reward items on any given list was alternated each time it was presented to the subject. The sixteen items were a ball point pen, one-half pound of mixed nuts, a six-ounce bottle of cologne, an eight-ounce jar of instant coffee, a six-ounce bottle of aftershave lotion, a dime, a five-ounce bottle of bath oil, a comb and brush set, a thirteen-ounce can of hairspray, a make-up kit,
three apples, three oranges, a pack of cigarettes, an eight-ounce jar of instant tea, a deck of playing cards, and four candy bars.

**Trial I, Condition I**

Each group assembled in an assigned classroom at one o'clock on a Monday for the first presentation of the spelling, retention, and resource tasks under the neutral reinforcement condition. One of the three unit staff members assigned to each group read the instructions for the spelling task. The remaining staff members were responsible for surveying subject performance.

The spelling task was administered with Group I beginning with the first word on the list, Group II beginning with the tenth word, and Group III beginning with the twentieth word. If any subject in Groups II or III missed their beginning word, the groups' starting point dropped three words. This procedure continued until every subject in Groups II and III spelled the first word correctly. The following instructions were administered to all groups:

The spelling words will be read aloud. You are to spell as many of the words as you can, stopping when you have misspelled five words. Ten words will be read aloud. When the tenth word has been read, the other two staff members will check your spelling. If anyone has misspelled five words, they will be asked not to attempt any more words. Those who have not misspelled five words will be asked to spell the next ten words read aloud. Your spelling will be checked after each word. When you have misspelled five words, you will be asked not to
attempt any more words. This procedure will continue until everyone has misspelled five words.

Once everyone has misspelled five words, they will make a study list. The study list will contain the correct spelling of the five misspelled words. You are to study these words and be prepared to be tested over them next Wednesday at eleven o'clock in the morning.

The retention task was administered after the spelling task was assigned. The instructions were as follows:

A retention lesson will be passed out to each of you. The five questions on the lesson sheet were taken from Our American Way of Life. To answer the questions, you will have to read a story from the book just mentioned. The pages you will have to read are numbered at the top of each lesson. Copies of Our American Way of Life are located in the unit library and are available to you at anytime. If you have trouble in finding the answers, unit personnel will help you. You will be tested over these questions this coming Wednesday at eleven o'clock in the morning.

The resource task was administered after the spelling and retention tasks had been assigned. The instructions were as follows:

A resource lesson will now be passed out to each one of you. There are five questions; one pertaining to dictionary usage, one pertaining to English grammar, one pertaining to presidents of the United States, one pertaining to constitutional amendments, and one pertaining to this hospital's personnel. The books you will need to answer the first four questions are located in the unit library. You will be required to go to other units to answer the fifth question. If you have trouble finding the answers, unit personnel will help you.

You will be tested over these questions this coming Wednesday at eleven o'clock in the morning. Are there any questions about this task?
A general summary of the three tasks was read. If a subject asked a question pertaining to the tasks, a direct and informative replay was given. However, other questions were responded to within the framework of neutral reinforcement. For example, if a subject asked what would happen to him if he did not do the assignment, a staff member would respond in a neutral manner by saying, "Nothing would happen to you." If a subject asked if he would receive anything for completing the assignment, a staff member would again respond in a neutral manner by saying, "Nothing would be given to you." Subjects were then dismissed for the day.

Wednesday, at eleven o'clock in the morning, the three groups were assembled in their assigned classrooms for the testing. In each group, one of the three unit staff members administered the tests while the other two staff members proctored and collected the answer sheets. The groups were then dismissed for lunch and told to return at one o'clock.

The tests were scored by three unit staff members, with a subject's score being determined on the basis of unanimous interjudge agreement. Each question had a value of one point, with a possible total score of fifteen points.

**Trial I, Condition II**

At one o'clock, the three groups reassembled in their assigned classrooms for the first presentation of the spelling, retention, and resource tasks under the positive
reinforcement condition. The tasks remained the same, but the questions were changed.

The procedure for administering task instructions remained the same. The following instructions were given:

We are now going to give the spelling, retention, and resource lessons again. The procedure will be essentially the same as the first time you were here.

The spelling words will be read aloud. Each person's beginning word will be the third word above the fifth word you misspelled last Monday. Question? Spelling words will be read in groups of ten. When the tenth word has been read aloud, your spelling will be checked. If anyone has misspelled five words, he will be asked not to attempt any more words. Those who have not misspelled five words will be asked to spell the next ten words read aloud. Your spelling will be checked after each word. When you have misspelled five words, you will be asked not to attempt any more words. This procedure will continue until everyone has misspelled five words.

When everyone has misspelled five words, they will make a study list. The study list will contain the correct spelling of the five misspelled words. You are to study these words and be prepared to be tested over them next Wednesday at eleven o'clock in the morning.

The retention and resource tasks were administered after the spelling task was assigned. The task instructions remained essentially the same as before.

Since the condition of reinforcement was now positive, the following instructions were administered after the presentation of tasks:

A list of sixteen items will now be passed around. Look at the list and select the item you would like to have. Put a check mark by your selection and return the list to a staff member.
At eleven o'clock this coming Friday, you will be tested over the questions given to you today. If you answer eleven of the fifteen questions correctly, the item you just selected will be given to you. Are there any questions? You are dismissed for the day.

Friday, at eleven o'clock in the morning, the three groups were assembled in their assigned separate classrooms for testing. One of the three unit staff members assigned to each group administered the tests. The other two staff members proctored and collected the answer sheets. The tests were scored immediately, using the same procedure as before. Those subjects answering eleven of fifteen questions correctly were given their previously selected reward. Subjects were then dismissed for lunch and told to return at one o'clock.

**Trial I, Condition III**

At one o'clock, the three groups reassembled in their assigned classrooms for the first presentation of the spelling, retention, and resource tasks under the negative reinforcement condition. Task structure and the procedure for administering task instructions remained the same.

Since the condition of reinforcement was now aversive, the following instructions were administered after the presentation of tasks:

At eleven o'clock this coming Monday morning, you will be tested over the questions given to you today. You will be required to answer eleven of fifteen questions correctly. If you fail to do so, you will be restricted from all canteen
privileges for the following two days. Are there any questions? You are dismissed for the day.

Monday, at eleven o'clock in the morning, the three groups were assembled in their assigned classrooms for testing. One of the three unit staff members assigned to each group administered the tests. The other two staff members proctored and collected the answer sheets. The tests were immediately scored. Those subjects answering eleven of fifteen questions correctly were dismissed to go to the canteen for lunch. Those subjects who did not answer eleven of fifteen correctly were told they would have to eat on the unit and would be restricted from all canteen privileges for the following two days.

The second and third trials were essentially the same as the first. The only difference was the sequence in which the conditions of reinforcement were presented. The presentation of the conditions of reinforcement for Trial II was positive, aversive, and neutral. The presentation of the conditions of reinforcement for Trial III was aversive, neutral, and positive.

Procedure for administering instructions, task procedure, and instructions for the conditions of reinforcement were the same for Trial II and Trial III.

Procedure for Collecting and Treating Data

After the selection of subjects, the administering of tasks, the taking of tests, and the scoring of tests, the raw data were transferred to a data sheet.
The statistical treatment used in this study was a three by three by three factorial design with repeated measures on two factors (6). Factor one was the three groups: low, intermediate, and high. Factor two was the conditions of reinforcement: aversive, neutral, and positive. Factor three was the length of the study. Factors two and three were the repeated measures. The statistical treatment was applied to each of the three learning tasks and their combined scores. The .05 level of significance was chosen as the basis upon which the hypotheses would be accepted. Graphs were constructed to clarify the results.


CHAPTER III

RESULTS AND DISCUSSION

Results

For the purpose of measuring the effects which three types of reinforcement have on performance, thirty-nine chronic undifferentiated schizophrenics were administered a spelling task, research tasks, and retention tasks. The data were analyzed statistically using a three by three by three factorial design with repeated measures on two factors (4). The statistical treatment was applied to each of the three learning tasks and their combined scores. The .05 level of significance was chosen as the basis upon which the hypotheses would be accepted.

Table I represents the analysis for the spelling task. It can be seen in Table I that all factors failed to reach the designated .05 level of significance.

Table II represents the analysis for the research task. It can be observed in Table II that two main effects, groups and trials, were significant at .01 and .05, respectively. The interaction between conditions of reinforcement and trials was found to be significant at .01, while the interaction among groups, conditions of reinforcement, and trials was significant at .05.
**TABLE I**

SUMMARY OF ANALYSIS OF VARIANCE FOR THE SPELLING TASK

<table>
<thead>
<tr>
<th>Source of Variability</th>
<th>Sum SQ</th>
<th>df</th>
<th>Mean SQ</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (A)</td>
<td>35.76</td>
<td>2</td>
<td>17.88</td>
<td>2.17</td>
</tr>
<tr>
<td>Error (A)</td>
<td>296.35</td>
<td>36</td>
<td>8.23</td>
<td>0.00</td>
</tr>
<tr>
<td>Reinforcement (B)</td>
<td>5.55</td>
<td>2</td>
<td>2.77</td>
<td>1.95</td>
</tr>
<tr>
<td>A X B</td>
<td>3.35</td>
<td>4</td>
<td>0.83</td>
<td>0.59</td>
</tr>
<tr>
<td>Error (B)</td>
<td>102.20</td>
<td>72</td>
<td>1.41</td>
<td>0.00</td>
</tr>
<tr>
<td>Trials (C)</td>
<td>0.83</td>
<td>2</td>
<td>0.41</td>
<td>0.54</td>
</tr>
<tr>
<td>A X C</td>
<td>7.29</td>
<td>4</td>
<td>1.82</td>
<td>2.36</td>
</tr>
<tr>
<td>Error (C)</td>
<td>55.64</td>
<td>72</td>
<td>0.77</td>
<td>0.00</td>
</tr>
<tr>
<td>B X C</td>
<td>4.32</td>
<td>4</td>
<td>1.08</td>
<td>1.52</td>
</tr>
<tr>
<td>A X B X C</td>
<td>6.76</td>
<td>8</td>
<td>0.84</td>
<td>1.19</td>
</tr>
<tr>
<td>Error (ABC)</td>
<td>101.79</td>
<td>144</td>
<td>0.70</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>619.89</td>
<td>350</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE II**

SUMMARY OF ANALYSIS OF VARIANCE FOR THE RESEARCH TASK

<table>
<thead>
<tr>
<th>Source of Variability</th>
<th>Sum SQ</th>
<th>df</th>
<th>Mean SQ</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (A)</td>
<td>222.60</td>
<td>2</td>
<td>111.30</td>
<td>6.78**</td>
</tr>
<tr>
<td>Error (A)</td>
<td>590.47</td>
<td>36</td>
<td>16.40</td>
<td>0.00</td>
</tr>
<tr>
<td>Reinforcement (B)</td>
<td>0.07</td>
<td>2</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>A X B</td>
<td>0.52</td>
<td>4</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>Error (B)</td>
<td>69.62</td>
<td>72</td>
<td>0.96</td>
<td>0.00</td>
</tr>
<tr>
<td>Trials (C)</td>
<td>9.06</td>
<td>2</td>
<td>4.53</td>
<td>4.87*</td>
</tr>
<tr>
<td>A X C</td>
<td>6.81</td>
<td>4</td>
<td>1.70</td>
<td>1.83</td>
</tr>
<tr>
<td>Error (C)</td>
<td>67.00</td>
<td>72</td>
<td>0.93</td>
<td>0.00</td>
</tr>
<tr>
<td>B X C</td>
<td>24.67</td>
<td>4</td>
<td>6.16</td>
<td>9.19**</td>
</tr>
<tr>
<td>A X B X C</td>
<td>12.51</td>
<td>8</td>
<td>1.56</td>
<td>2.33*</td>
</tr>
<tr>
<td>Error (ABC)</td>
<td>96.58</td>
<td>144</td>
<td>0.67</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>1099.97</td>
<td>350</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at .05.

**Significant at .01.
Table III represents the analysis for the retention task. Table III shows that two main effects, groups and trials, were significant at .01. The interaction between conditions of reinforcement and trials was found to be significant at .05, while the interaction among groups, conditions of reinforcement, and trials was significant at .01.

Table IV represents the analysis for the total score. It can be seen in Table IV that one main effect, groups, was significant at .01. The interaction between trials and conditions of reinforcement and the interaction among groups, conditions of reinforcement, and trials were found to be significant at .01.

### TABLE III

**SUMMARY OF ANALYSIS OF VARIANCE FOR THE RETENTION TASK**

<table>
<thead>
<tr>
<th>Source of Variability</th>
<th>Sum SQ</th>
<th>df</th>
<th>Mean SQ</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (A)</td>
<td>144.94</td>
<td>2</td>
<td>72.47</td>
<td>6.26**</td>
</tr>
<tr>
<td>Error (A)</td>
<td>416.71</td>
<td>36</td>
<td>11.57</td>
<td>0.00</td>
</tr>
<tr>
<td>Reinforcement (B)</td>
<td>4.30</td>
<td>2</td>
<td>2.15</td>
<td>1.80</td>
</tr>
<tr>
<td>A X B</td>
<td>7.62</td>
<td>4</td>
<td>1.90</td>
<td>1.59</td>
</tr>
<tr>
<td>Error (B)</td>
<td>85.84</td>
<td>72</td>
<td>1.19</td>
<td>0.00</td>
</tr>
<tr>
<td>Trials (C)</td>
<td>9.09</td>
<td>2</td>
<td>4.54</td>
<td>5.43**</td>
</tr>
<tr>
<td>A X C</td>
<td>2.42</td>
<td>4</td>
<td>0.60</td>
<td>0.72</td>
</tr>
<tr>
<td>Error (C)</td>
<td>60.25</td>
<td>72</td>
<td>0.83</td>
<td>0.00</td>
</tr>
<tr>
<td>B X C</td>
<td>10.95</td>
<td>4</td>
<td>2.73</td>
<td>2.65*</td>
</tr>
<tr>
<td>A X B X C</td>
<td>32.85</td>
<td>8</td>
<td>4.10</td>
<td>3.98**</td>
</tr>
<tr>
<td>Error (ABC)</td>
<td>148.41</td>
<td>144</td>
<td>1.03</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Total**               | 923.43 | 350|         |       |

*Significant at .05.

**Significant at .01.
### TABLE IV

**SUMMARY OF ANALYSIS OF VARIANCE FOR THE TOTAL SCORE**

<table>
<thead>
<tr>
<th>Source of Variability</th>
<th>Sum SQ</th>
<th>df</th>
<th>Mean SQ</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
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<td>522.74</td>
<td>5.76*</td>
</tr>
<tr>
<td>Error (A)</td>
<td>3264.99</td>
<td>36</td>
<td>90.69</td>
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</tr>
<tr>
<td>Reinforcement (B)</td>
<td>17.64</td>
<td>2</td>
<td>8.82</td>
<td>2.56</td>
</tr>
<tr>
<td>A X B</td>
<td>11.08</td>
<td>4</td>
<td>2.77</td>
<td>0.80</td>
</tr>
<tr>
<td>Error (B)</td>
<td>247.93</td>
<td>72</td>
<td>3.44</td>
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</tr>
<tr>
<td>Trials (C)</td>
<td>1.13</td>
<td>2</td>
<td>0.56</td>
<td>0.20</td>
</tr>
<tr>
<td>A X C</td>
<td>14.83</td>
<td>4</td>
<td>3.70</td>
<td>1.35</td>
</tr>
<tr>
<td>Error (C)</td>
<td>197.36</td>
<td>72</td>
<td>2.74</td>
<td>0.00</td>
</tr>
<tr>
<td>B X C</td>
<td>68.57</td>
<td>4</td>
<td>17.14</td>
<td>5.68*</td>
</tr>
<tr>
<td>A X B X C</td>
<td>67.76</td>
<td>8</td>
<td>8.47</td>
<td>2.80*</td>
</tr>
<tr>
<td>Error (ABC)</td>
<td>434.32</td>
<td>144</td>
<td>3.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>5371.15</td>
<td>350</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at .01.

**Discussion**

This discussion is limited to the implications of the results just presented. To promote continuity of the study, the results will be discussed in the order of stated hypotheses found in Chapter I.

In Hypothesis I it was stated that there would be a significant interaction between the functional educational level of groups and the conditions of reinforcement. The results of the analysis of variance for the spelling task, research tasks, retention tasks, and total score are shown in Tables I, II, III, and IV, respectively. F ratios for these variables on the learning tasks and their combined scores did not reach the .05 level of significance; therefore, the
hypothesis was rejected. This would indicate that a group's performance was independent of the conditions of reinforcement. However, the lack of an interaction between these variables may have been due to the statistically significant interaction between conditions of reinforcement and length of study, and the three-way interaction among functional educational level of groups, conditions of reinforcement, and trials.

It was predicted in Hypothesis II that all subjects would score significantly higher on the learning tasks under the conditions of aversive reinforcement than under the conditions of positive or neutral reinforcement. It can be seen in Tables I, II, III, and IV that the F ratios for conditions of reinforcement did not reach the designated .05 level of significance. This not only indicates that subjects failed to score significantly higher under aversive reinforcement, but that their performance was independent of the conditions of reinforcement. Ostensibly, the statistical significance of the interaction between conditions of reinforcement and trials and the interaction of groups with conditions of reinforcement and trials negated any possible significant effects of aversive reinforcement as a main effect variable.

In Hypothesis III it was predicted that all subjects would score significantly higher under the conditions of positive reinforcement than under the conditions of neutral
reinforcement. The data, as shown in Tables I, II, III, and IV, do not sustain the hypothesis. This indicates, as it did for Hypothesis II, that conditions of reinforcement are not only differentially nonsignificant but collectively ineffective when considered as a main effect variable.

It was stated in Hypothesis IV that there would not be a significant interaction among functional educational level of groups, conditions of reinforcement, and trials. As indicated in Tables II, III, and IV, the F ratios for the three-way interaction were significant at .05, .01, and .01, respectively. However, it can be seen in Table I that the F ratio for the three-way interaction was not significant at .05; therefore, the hypothesis was partially supported. The significant three-way interaction on the research task, retention task, and the total score would indicate that a subject's performance, in some respect, is affected by his functional educational level, the condition of reinforcement currently in use, and the length of time the subject had been in the study. Furthermore, it accentuates the need to account for these variables in future research of this nature. The lack of a significant three-way interaction on the spelling task was apparently a function of task design.

Essentially, this study attempted to ascertain the relationship between the functional educational level of groups and the condition or conditions of reinforcement that were capable of eliciting the best performance from chronic
undifferentiated schizophrenics. The results of this study did not support the stated hypotheses found in Chapter I, indicating that reinforcement was collectively as well as differentially ineffective when considered as a main effect variable. However, significant results were found that accentuated the need for assessing how the variables under consideration affected a subject's performance. In addition to the statistical treatment stated in Chapter II, post-experimental interviews were conducted. An interview consisted of a staff member administering a questionnaire that was designed to elicit a subject's opinion on the conditions of reinforcement, their personal involvement in the study, and task difficulty. An example of this questionnaire can be found in Appendix D.

It can be seen in Tables II, III, and IV that the functional educational level of groups was significant at .01. This would indicate that regardless of conditions of reinforcement or trials, the low, intermediate, and high groups differed significantly from each other in their performance on the research tasks, retention tasks, and the total score. Figure 1 illustrates the direction of group differences in performance on the total score. On the total score, it can be seen that subjects in Group I had the lowest mean score, with Group II having a higher mean score than Group I but a lower mean score than Group III. This observation is compatible with Sanders, Smith, and Weinman's findings that
chronic schizophrenia should no longer be viewed as a unitary entity, characterized by progressive apathy, withdrawal, and alienation" (3, p. 107). The authors indicated that the chronic patients in mental hospitals were not only psychotic but they were poorly trained, poorly educated, and inadequately socialized. Chronic schizophrenia was interpreted in terms
of reactivity level. The chronic schizophrenics in their study distinguished themselves as having either a high or a low reactivity level. Patients who were described as having a low reactivity level were characterized by a low level of physical activity, a reduced drive level, and a long duration of illness. In learning situations, it was found that these patients were more responsive to maximized structured conditions than to partially structured conditions. High reactivity patients were characterized by a heightened drive level, an inability to maintain impulse control, and a heightened demand for social interaction. For this type of patient, a desire for social interaction would facilitate undesirable behavior because of an inability to control impulses. Therefore, a high reactivity patient should experience sheltered and supportive situations in order to lessen drive level and enhance behavior control.

Subjects in Group I are similar to the low reactivity patient just described, whereas subjects in Group III are representative of the high reactivity classification. It can be seen in Figure 1 that the direction of group performance is inversely related to what would be expected according to Smith, Sanders, and Weinman's (3) hypothesis. However, an analysis of the task structure employed in this study would reveal that the tasks were either partially or minimally structured. From this observation, the direction of group performance would be compatible with the concept of reactivity level.
Figure 2 represents the mean performance of all groups on the research and retention tasks. The direction of group differences in performance on the research and retention tasks is similar to that found on the total score. It should also be noted that the overall performance on the retention task was higher than the overall performance on the research task. Apparently, the retention task was not difficult for any group. In support of this finding, post-experimental
interviews revealed that only 3 per cent of the subjects considered the retention task to be the most difficult.

The differences in group performance noted in Figures 1 and 2 could be interpreted within the theoretical model proposed by Fontana, Lewis, Klein, and Levine. Their theory proposes that "... a substantial amount of 'psychopathological' behavior is maintained and elicited in accordance with the characteristics of the person's current social situation" (1, p. 110). The motivation to create a sick-incompetent impression versus a healthy-competent impression on others is the central theme of "self-presentation." In our society, people are consistently rewarded for appearing logical and rational; therefore, when someone exhibits "pathological" behavior, an assumption that the person is sick or incompetent usually occurs. However, people may play a role, be it rational or irrational, to obtain satisfaction in their current social situation.

These authors propose that all mental patients, particularly chronic schizophrenics, may create an impression of being sick or healthy as an intermediate goal that is instrumental to their attaining subsequent goals. However, this theory does not hold that patients are always aware that they are creating an impression; in fact, many patients unconsciously present themselves as sick or incompetent. It is suggested that the following may be the case:
There are several interrelated goals which motivate a person to present himself to others as a crazy, sick, incompetent person. If a person is seen in this way, people are not likely to make demands on him or are not likely to persist in their demands. He cannot justifiably be held accountable for his actions, because no one can expect an irresponsible crazy person to know what he is doing. Passivity and gratification of dependency needs are legitimized, since society accepts the position that the sick cannot care for themselves and must be cared for. If the person is hospitalized, all these goals may be met by virtue of his status as a mental patient (1, p. 111).

On the other hand, a chronic schizophrenic may present a healthy, competent behavior pattern to gain staff influence and receive additional privileges.

Much of the literature on psychological deficit, as presented in Chapter I, indicated that a schizophrenic could not perform as efficiently as a non-schizophrenic because of a limited ability or limited motivation. The findings of these studies were contradictory and did not support the hypotheses of schizophrenic deficit. None of the variables shown to alter schizophrenic deficit were capable of consistently alleviating the initial differences between the schizophrenic and non-schizophrenic groups. Due to these inconsistencies, the theory of "Self-Presentation" (1) seems to warrant detailed consideration.

It can be seen in Tables II and III that the length of the study was significant at .05 and .01 respectively. Since this variable was not significant on the spelling task or total score, it would indicate that the effects of time
were either particular to certain types of tasks or that the lack of significance on the spelling task counteracted the other two tasks' influence on the total score. On the other hand, the lack of significance on the total score could have been the result of time interacting with functional educational level of groups and conditions of reinforcement.

Figure 3 illustrates the effects of time on the retention and research tasks. It can be seen on the retention
task that all groups performed at about the same level on the first and second trial with their performance tapering off significantly during the last trial. This decrease in performance was seemingly the result of task boredom since the overall performance was highest for this task and since post-experimental interviews indicated that subjects perceived this task as the least challenging. A further analysis of the results seemed to indicate that the rise in performance on the research task was due to either task familiarity or an increasing interest in the task.

An analysis of Tables II, III, and IV shows that an interaction between conditions of reinforcement and length of study was significant at .01, .05, and .01, respectively. This would indicate that a subject's performance, regardless of his functional educational level, was influenced by the interaction between the condition of reinforcement operating at that moment and the length of time he had been in the study. Figure 4 represents this interaction on the total score.

On the total score, it can be observed that all groups during Trial I scored higher under the aversive condition of reinforcement, with the neutral reinforcement condition being the least effective. Positive reinforcement was the most effective during Trial II, with aversive and neutral reinforcement having similar, but less significant, effects.
During the first week of the study, all subjects were apparently responding to aversive reinforcement from a response set (3). Hospitalized chronic schizophrenics are accustomed to aversive reinforcement because many of the treatment programs designed to modify patient behavior incorporate this type of reinforcement as the main element.
On the other hand, their performance may have been the result of something other than response set. Past research has attempted to show that the chronic schizophrenic performs at his best when aversive reinforcement is used. However, the results of this study do not support that proposition. As previously mentioned, Lindsley (2) characterizes this type of patient as being uncooperative and suspicious. This being the case, the subjects in this study were not certain they would receive their reward or that nothing would happen to them if they did not do the task. A further explanation would be that the aversive reinforcement was seen as having more value to the subjects than the positive reward items.

Subjects, during the second week of the study, favored the positive reinforcement condition. This could have been the result of the subjects' adjusting to the experiment; that is, they were able to see for themselves that the previously stated procedures were going to be followed. They also had the opportunity to see the positive reward items, which could have generated an overall enthusiasm for this condition of reinforcement. Aversive reinforcement was at its lowest value during the second week, apparently non-meaningful at this point. This tends to support the view that the subjects during the first week of the study were reacting to a previously established response set.

Neutral reinforcement proved to be the most effective during the third week. Apparently, task fatigue or the
reduction in preference for positive or aversive reinforcement caused the effects of positive reinforcement to diminish. However, this condition did not decline to a level below that of its original effectiveness, which indicates that positive reinforcers can benefit performance but other variables must be considered.

Aversive reinforcement gained slightly during the third week, but not to a level of original effectiveness. Overall, the effectiveness of aversive reinforcement did not meet the expectations of past research. However, this could be due to the value of the condition; that is, after the first week the punishment was not perceived as being severe enough to warrant concern over the tasks. As noted in Figure 4, neutral reinforcement gained steadily in effectiveness over the three weeks. This indicates an overall preference for non-demanding situations or a lack of preference for positive or aversive reinforcement.

Figures 5 and 6 illustrate the interaction between conditions of reinforcement and length of study on the research and retention tasks. The trends on the research and retention tasks were similar to those found on the total score. The differences that can be noted are apparently due to the effects of task difficulty.

It can be seen in Tables II, III, and IV that the interaction among functional educational level of groups, conditions of reinforcement, and length of study was significant
Fig. 5—Interaction between conditions of reinforcement and length of the study on the research task as measured in mean scores.

at .05, .01, and .01, respectively. This would indicate that a subject's performance was a result of his functional educational level, the condition of reinforcement operating at that moment, and the length of time spent in the study. The means for the three-way interaction on the total score, research tasks, and retention tasks can be seen in Tables V, VI, and VII, respectively. It can be seen in Tables V, VI, and VII that the trends for the three-way interaction are
Fig. 6--Interaction between conditions of reinforcement and length of the study on the retention task as measured in mean scores.

similar to those previously mentioned for the interaction between conditions of reinforcement and length of the study. The only exception was the influence of the groups found in the three-way interaction.

Summary

The purpose of Chapter III was to present the results and to discuss the data in terms of their relevance to the study. The hypotheses were stated and the level of significance was .05.
TABLE V
SUMMARY TABLE OF MEANS FOR ABC INTERACTION ON TOTAL SCORE

<table>
<thead>
<tr>
<th>Reinforcement (B)</th>
<th>Neutral b₁</th>
<th>Positive b₂</th>
<th>Aversive b₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trials (C)</td>
<td></td>
<td>Trial I</td>
<td>Trial II</td>
</tr>
<tr>
<td></td>
<td>c₁</td>
<td>c₂</td>
<td>c₃</td>
</tr>
<tr>
<td>Groups (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low a₁</td>
<td>7.461</td>
<td>8.923</td>
<td>8.000</td>
</tr>
</tbody>
</table>

TABLE VI
SUMMARY TABLE OF MEANS FOR ABC INTERACTION ON RESEARCH TASK

<table>
<thead>
<tr>
<th>Reinforcement (B)</th>
<th>Neutral b₁</th>
<th>Positive b₂</th>
<th>Aversive b₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trials (C)</td>
<td></td>
<td>Trial I</td>
<td>Trial II</td>
</tr>
<tr>
<td></td>
<td>c₁</td>
<td>c₂</td>
<td>c₃</td>
</tr>
<tr>
<td>Groups (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low a₁</td>
<td>2.153</td>
<td>1.846</td>
<td>2.307</td>
</tr>
</tbody>
</table>
TABLE VII
SUMMARY TABLE OF MEANS FOR ABC INTERACTION ON RETENTION TASK

<table>
<thead>
<tr>
<th>Reinforcement (B)</th>
<th>Neutral $b_1$</th>
<th>Positive $b_2$</th>
<th>Aversive $b_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trial I</td>
<td>Trial II</td>
<td>Trial III</td>
</tr>
<tr>
<td>Trials (C)</td>
<td>$c_1$</td>
<td>$c_2$</td>
<td>$c_3$</td>
</tr>
<tr>
<td>Groups (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Except for a portion of Hypothesis I, all hypotheses were rejected, indicating that a subject's performance was not the result of an interaction between functional educational level of groups and conditions of reinforcement. However, significant results were found and analyzed to determine their effects on performance.

Functional educational level of the groups was found to be significant, which indicated that the groups differed in performance regardless of the condition of reinforcement or the length of the study. This observation was interpreted within the concepts of "reactivity level" and "self-presentation." It was concluded that the differences in group performance were the result of a subject creating an impression of being incompetent or competent.

An interaction between conditions of reinforcement and length of study was found to be significant, indicating that a subject's performance was independent of his functional educational level. During the first week of the study, aversive reinforcement was the most effective condition. It was suggested that subjects responded in this manner because of a previously established response set. This was seemingly the result of the subjects' adjusting to the experiment; that is, they were able to judge the reliability of the task procedures. During the third week, neutral reinforcement proved to be the most effective. It was stated that the effects of this condition of reinforcement had steadily
increased over the three-week period, suggesting an overall preference for non-demanding situations or a lack of preference for positive or aversive reinforcement.

A three-way interaction was found to be significant, indicating a subject's performance was a result of his functional educational level, conditions of reinforcement, and length of the study. It was suggested that this type of interaction accentuates the need to account for these variables in future research.
CHAPTER BIBLIOGRAPHY


Summary

The purpose of this study was to determine the relationship among functional educational level of groups, conditions of reinforcement, and length of the study and their effects on subject performance.

The hypotheses were stated as follows:

I. There will be a significant interaction between functional educational level of groups and conditions of reinforcement.

II. All subjects will score significantly higher on the learning tasks under the condition of aversive reinforcement than under the condition of positive reinforcement.

III. All subjects will score significantly higher on the learning tasks under the condition of positive reinforcement than under the condition of neutral reinforcement.

IV. There will not be a significant interaction among functional educational level of groups, conditions of reinforcement, and length of the study.

Thirty-nine chronic undifferentiated schizophrenics were used in this study. Their ages ranged from twenty to fifty years. Their achieved educational level, as determined from
case histories, ranged from first grade to twelfth, with a mean of the fifth grade. The severity of illness was judged to be homogeneous by the psychology staff. These subjects were divided into three groups, low, intermediate, and high, on the basis of their functional educational level. This was determined by the Wechsler Adult Intelligence Scale, the Wide Range Achievement Test, and a subjective clinical appraisal of a subject's general level of functioning.

The instruments used in this study were a spelling task, a series of retention lessons, and a series of resource lessons. The conditions of reinforcement were neutral, aversive, and positive. The study was divided into three trials of one week each. During Trial I, subjects were administered the three learning tasks under neutral, positive, and aversive conditions of reinforcement. The second and third trials were the same except for the order of presentation of reinforcement. The sequence for Trial II was positive, aversive, and neutral, while the order for Trial III was aversive, neutral, and positive.

Following the collection and tabulation of the data, the results were analyzed using a three by three by three factorial design with repeated measures on two factors, with factors two and three being the repeated measures.

The statistical treatment revealed the following:

Hypothesis I was not accepted. This indicated that group performance was independent of the conditions of reinforcement.
Hypothesis II was not sustained. Subjects did not score significantly higher under aversive reinforcement; in fact, their performance was independent of the conditions of reinforcement.

Hypothesis III was not confirmed. Subjects did not score significantly higher under positive reinforcement than under the conditions of neutral reinforcement. This indicated, as it did for Hypothesis II, that conditions of reinforcement were differentially as well as collectively ineffective when considered as a main effect variable.

Hypothesis IV was partially supported. A significant three-way interaction was not found on the spelling task; however, an interaction among the three factors was significant on the research task, retention task, and the total score. This finding accentuates the need to account for these factors in future research.

The results of this study did not support the stated hypotheses. However, significant results were found and discussed. The functional educational level of groups was found to be significant. This finding was interpreted within the concepts of "Self-Presentation" and "Reactivity Level." The possibility of subjects creating an impression of being competent or incompetent was discussed.

An interaction between conditions of reinforcement and length of the study was significant. An analysis of this interaction revealed that all subjects were more responsive
to aversive reinforcement during Trial I. It was interpreted that the subjects were responding from a previously established response set. Positive reinforcement was the most effective during Trial II, indicating that positive reinforcers were beneficial to subject performance when other variables were considered. Neutral reinforcement gained steadily during Trials I and II, proving to be the most effective in Trial III. It was stated that subjects had either a preference for non-demanding situations or a lack of preference for the other two conditions of reinforcement.

A significant three-way interaction was found on the research task, retention task, and the total score. This revealed that a subject's performance was a result of his functional educational level, conditions of reinforcement, and length of the study.

Recommendations

Based on the results and conclusions of this investigation, several additional related conditions require further exploration.

1. Hospitals developing educational programs should consider the interaction between the conditions of reinforcement and length of the program when developing rehabilitative programs for chronic schizophrenics.

2. Hospitals developing educational programs should consider the possibility of interpreting functional educational level within the theoretical model of "Self-Presentation."
3. Hospitals developing educational programs should consider additional research in the area of developing educational tasks that would measure subject motivation more directly.

4. Hospitals should consider additional research in the area of determining those factors that have significant positive or aversive reinforcement value for chronic schizophrenics when developing rehabilitative educational programs.

5. Hospitals developing educational programs should consider functional educational level, conditions of reinforcement, and length of the program when investigating other variables they consider relevant to patient performance in a rehabilitative educational program.

6. Hospitals should consider the possible relationship between classroom structure, maximum versus partial structure, and patient performance in a rehabilitative educational program.
### APPENDIX A

**SPELLING TASK**

| 1. cat | 38. grandfather |
| 2. boy | 39. goose |
| 3. dog | 40. breakfast |
| 4. hat | 41. sunshine |
| 5. him | 42. daughter |
| 6. see | 43. already |
| 7. was | 44. automobile |
| 8. my | 45. understand |
| 9. am | 46. pleasure |
| 10. look | 47. basement |
| 11. run | 48. interesting |
| 12. good | 49. regular |
| 13. fast | 50. throat |
| 14. make | 51. believed |
| 15. white | 52. conductor |
| 16. apple | 53. excellent |
| 17. cry | 54. groceries |
| 18. happy | 55. machinery |
| 19. grass | 56. opposite |
| 20. school | 57. prettiest |
| 21. money | 58. separate |
| 22. anything | 59. television |
| 23. because | 60. vegetables |
| 24. yesterday | 61. instruction |
| 25. rabbit | 62. neighborhood |
| 26. afternoon | 63. publication |
| 27. friend | 64. interrupt |
| 28. outside | 65. situation |
| 29. riding | 66. dismissed |
| 30. sometime | 67. gradually |
| 31. animal | 68. performance |
| 32. elephant | 69. argument |
| 33. Thursday | 70. conclusion |
| 34. September | 71. demonstration |
| 35. December | 72. adjustment |
| 36. family | 73. correspondence |
| 37. building | 74. inconvenience |
| 75. refrigerator | 76. sympathy |
| 77. microphone | 78. electricity |
| 79. legislature | 80. acknowledgment |
| 81. accommodate | 82. achievement |
| 83. acquaintance | 84. acre |
| 85. all right | 86. aluminum |
| 87. anxious | 88. appreciate |
| 89. athletics | 90. conquer |
| 91. bureau | 92. convenience |
| 93. criticism | 94. desperate |
| 95. discipline | 96. dissatisfied |
| 97. embarrass | 98. fatigue |
| 99. genuine | 100. gymnastics |
| 101. monotonous | 102. nuisance |
| 103. parallel | 104. restaurant |
| 105. rhythm | 106. separate |
| 107. siege | 108. superintendent |
| 109. surgeon | 110. tragedy |
APPENDIX B

RETEINION TASK

1. Who wanted to find a job?  Pages 33 & 34

2. What job did he inquire about?

3. Who did Peter go to see?

4. How many years had Peter worked in a factory?

5. What did Peter have to do before starting to work?
APPENDIX C

RESEARCH TASK

1. Give an example of an antonym.

2. What right is protected by the 15th Amendment to the U. S. Constitution?

3. What is the meaning of the word travail?

4. Who was the 7th President of the United States?

5. Who is the Chief Accountant at Big Spring State Hospital?
APPENDIX D

POST-EXPERIMENTAL QUESTIONNAIRE

If we were to run the special learning lessons again check how you would rather have it done:

1. Have nothing given or taken away from you for learning—just give the lesson and you do the work.

2. Assign a penalty for not learning; that is, no canteen break if the lesson is not learned.

3. Give a reward or prize to those who learn the lesson.

Check "Yes" or "No" to the questions below:

Yes ___ No ___ The past few weeks have been fun.

Yes ___ No ___ The work was very hard to learn.

Yes ___ No ___ I studied, but could not remember the answers for the test.

Yes ___ No ___ I learned many new things.

Yes ___ No ___ If the prizes were better, I would have worked harder.

Yes ___ No ___ If the restriction from the canteen was longer, I would have worked harder.

Yes ___ No ___ I would like more lessons like this again.

Which task was the hardest?
Spelling ______ Questions over the stories ______ Research questions ______
They were all difficult ______
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